

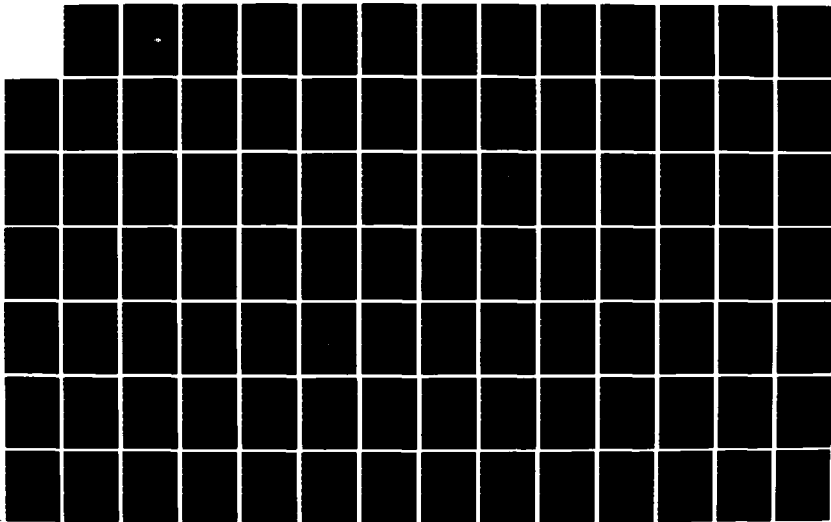
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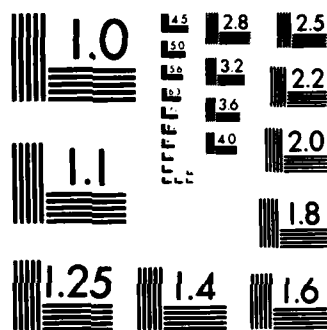
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1) SUBJECT INDEX

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PURPOSE

The purpose of this report is to inform Air Force Laboratories about the science that the Air Force Office of Scientific Research is supporting.

A

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Personal Author - Person or persons who wrote the report.

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*ULLMAN, J. D.

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*VERBER, C. M.

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Chemical Vapor Deposition of Silicon from Silane. Unimolecular Decomposition of SiH4.
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*WALLACE, A. K.

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- *WAX, M. * * *
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AD-A147 148
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AD-A144 610
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AD-A148 838

*ZIMM, M. B.

Energetics and Dynamics of Radical
Pairs in Micelles. Measurement of
the Average Singlet-Triplet Energy
Gap by Means of the Magnetic Field
Dependence of (13)C CIDNP.
AD-A144 475

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Single Pulse Temperature
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Assisted Atomic Fluorescence
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AD-A147 150

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ABSTRACTS

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AD-B087 004L 11/4 11/2 11/9 20/11 AD-B087 004L CONTINUED

CALIFORNIA UNIV LOS ANGELES SCHOOL OF ENGINEERING AND APPLIED SCIENCE

Ferroelectric crystals, Oxygen, Transparency, Melting point, Research management

(U) Preparation and Properties of Halide Glasses and Glass-Polymer Composites.

IDENTIFIERS: (U) WJAFOSR2303A3, PE81102F

DESCRIPTIVE NOTE: Final technical rept. 1 Oct 82-30 Sep 83,

SEP 83 23P

PERSONAL AUTHORS: Mackenzie, J. D. ;

CONTRACT NO. F49620-83-K-0003

PROJECT NO. 2303

TASK NO. A3

MONITOR: AFOSR
TR-84-0892

UNCLASSIFIED REPORT

Distribution limited to U.S. Gov't. agencies only; Test and Evaluation; 28 Sep 84. Other requests must be referred to Air Force Office of Scientific Research, Attn: XOTD, Bldg. 410, Bolling AFB, DC 20332.

ABSTRACT: (U) Research has been carried out on two families of solids. The first one involves fluoride, chloride and bromide glasses. The second one involves microporous silica glass and gels impregnated with organic polymers as well as inorganic crystals. The viscosity, vibrational spectra, chemical durability, fiber preparation and effects on oxygen on the properties of fluorozirconates have been studied. A number of new halide glasses were prepared. Microporous silica glass impregnated with PMMA was found to be highly transparent in the visible and possesses abnormal properties. Many crystals impregnated into silica glass were found to have their melting points depressed and some crystallographic transitions were also suppressed. (Author)

DESCRIPTORS: (U) *Composite materials, *Glass, *Polymers, *Halides, Porous materials, Fluorides, Zirconates, Crystals, Chlorides, Bromides, Silica glass, Impregnation, Crystallization, Viscosity, Vibrational spectra, Chemical properties, Endurance(General), Fibers, Preparation.

AD-B087 004L

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AD-B088 585L 7/3 7/4

AD-B088 251L 18/3 9/8 8/11

SRI INTERNATIONAL MENLO PARK CA

WOODWARD-CLYDE CONSULTANTS PASADENA CA

(U) Synthesis of Liquid Crystalline, Extended-Chain Polymer Compositions in Poly(Phosphoric Acid).

(U) An Attenuation Bias Measurement for the Semipalatinsk Test Site from Multiple S Phases.

DESCRIPTIVE NOTE: Final rept. 15 Nov 80-14 Nov 82.

DESCRIPTIVE NOTE: Semi-annual technical rept. 15 Dec 83-15 Jun 84.

MAY 83 38P

AUG 84 59P

PERSONAL AUTHORS: Wolfe, J. F.; Sybert, P. D.;

PERSONAL AUTHORS: Grand, S.; Helmlinger, D. V.; Burdick, L. J.;

CONTRACT NO. F49620-81-K-0003

PROJECT NO. 2303

REPORT NO. WCCP-R-84-08

TASK NO. A3

CONTRACT NO. F49620-83-C-0030, ARPA Order-4493

MONITOR: AFOSR
TR-83-1124

MONITOR: AFOSR
TR-84-1064

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

Distribution limited to DoD only; Specific Authority: 3 Oct 84. Other requests must be referred to Air Force Office of Scientific Research/XOT, Building 410, Bolling AFB, Washington, DC 20332.

Distribution limited to U.S. Gov't. agencies only; Test and Evaluation; 2 Oct 84. Other requests must be referred to DARPA/TIO, 1400 Wilson Blvd., Arlington, VA 22209.

ABSTRACT: (U) A general synthesis procedure is described for preparing liquid-crystalline compositions that contain poly(phosphoric acid) and aromatic, heterocyclic, extended chain homopolymers, random copolymers, or block copolymers. The polymers are characterized by rigid or semirigid molecular structures having benzobisthiazole, benzobisoxazole, benzothiazole, benzoxazole, or benzimidazole units in the main chain.

ABSTRACT: (U) One of the fundamental problems in monitoring nuclear explosion treaties is the accurate estimation of yield on the basis of teleseismic data. Absorption along the raypath is one of the most significant factors to be accounted for in interpreting the data. This factor is particularly difficult to treat because body wave attenuation exhibits substantial lateral variation. This means that though we may be able to measure Q in some regions of the world using locally recorded data, we cannot necessarily extrapolate our results to foreign test sites. Recently, we have made some progress in remote sensing by using the multi-bounce phase SS to estimate Q beneath these foreign sites. This technique was applied to the Kazakh region, resulting in estimates of t sub alpha bias similar to those expected for a stable shield, namely δt sub alpha = 0.2 sec.

DESCRIPTORS: (U) *Synthesis(Chemistry). Liquid crystals. Polymers, Benzoxazoles, Phosphoric acids, Benzimidazoles, Block copolymers, Molecular structure, Chains, Semirigid

IDENTIFIERS: (U) Benzothiazoles, LPN-PYU-2485, PE81102F

DESCRIPTORS: (U) *Nuclear explosion detection. *Telemetering data, *Seismic data, Yield(Nuclear explosions), Wave propagation, Ray tracing, Remote areas, Bias, Test facilities, Site selection, Southeast Asia, Earth mantle

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AD-A147 187 12/1

IDENTIFIERS: (U) *Semipalantinsk site, Kazakh region

NORTH CAROLINA UNIV AT CHAPEL HILL CENTER FOR STOCHASTIC PROCESSES

(U) The Symmetry Group and Exponents of Operator Stable Probability Measures.

DESCRIPTIVE NOTE: Technical rept.,

AUG 84 17P

PERSONAL AUTHORS: Hudson, W. N. ; Jurek, Z. J. ; Veeh, J. A. ;

REPORT NO. TR-72

CONTRACT NO. F49620-82-C-0009

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR
TR-84-0916

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Prepared in cooperation with Tufts Univ., Medford, MA. Dept. of Mathematics and Auburn Univ., AL. Dept. of Mathematics.

ABSTRACT: (U) There exists exponents of an operator stable measure which commute with every operator in the measure's symmetry group. These exponents together with a new norm lead to some simplifications in the representation of the Levy measure. (Author)

DESCRIPTORS: (U) *Stochastic processes, Probability, Operators(Mathematics), Multivariate analysis, Vector spaces, Theorems

IDENTIFIERS: (U) Operator stable measure, PES1102F, WUAFOSR2304A5

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SEARCH CONTROL NO. EVI198

AD-A147 186 20/4

CALIFORNIA UNIV SANTA CRUZ DEPT OF MATHEMATICS

(U) Dynamical Characteristics of Weak Turbulence.

DESCRIPTIVE NOTE: Annual Interim technical rept. 1 Apr 83-31 Mar 84.

AUG 84 16P

PERSONAL AUTHORS: Guckenheimer, J. ;

CONTRACT NO. AFOSR-83-0143

PROJECT NO. 2304

TASK NO. A4

MONITOR: AFOSR
TR-84-0914

UNCLASSIFIED REPORT

ABSTRACT: (U) This project is an exploration of dynamical features of chaotic physical systems with the emphasis upon turbulent fluids. The specific areas of investigation involve (1) the development of techniques that discriminate measurable differences in the observed behavior of theoretical models for chaotic behavior, (2) the application of these techniques to experimental studies, and (3) the study of bifurcation behavior in multiparameter families of differential equations. The transition to chaotic behavior in fluids has received intense experimental study during the past ten years. Various 'routes to chaos' have been studied, and a satisfying picture has emerged of how this transition proceeds in low dimensional dynamical systems. Our primary interest is in the behavior of a system after it has undergone the transition. Of central concern is the question of determining when low dimensional chaotic models provide a good description of the physical system.

DESCRIPTORS: (U) *Differential equations, *Turbulence, *Fluids, Transitions, Parameters, Models, Theory, Dynamics

IDENTIFIERS: (U) PEB1102F, WJAFOSR2304A4

AD-A147 186

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AD-A147 177 14/2

NEW MEXICO UNIV ALBUQUERQUE BUREAU OF ENGINEERING RESEARCH

(U) A General Theory of Circuit Analogy in Fracture Diagnosis.

DESCRIPTIVE NOTE: Interim rept. 15 Feb 83-15 Feb 84.

MAR 84 77P

PERSONAL AUTHORS: Akgun, M. ; Ju, F. D. ; Paez, T. L. ;

REPORT NO. ME124(84)AFOSR-993-1

CONTRACT NO. AFOSR-81-0086

PROJECT NO. 2307

TASK NO. C2

MONITOR: AFOSR
TR-84-0910

UNCLASSIFIED REPORT

ABSTRACT: (U) The present report develops electrical analogs to investigate multiple cracks on simple beams and more complex frame structures. Analog networks provide the economic tool to analyze such structures. The effect of multiple cracks on the natural frequencies of simple structures is studied in detail. It is shown that closely spaced multiple cracks are indistinguishable from an effective single crack. A severe crack on a structure can be identified if there are only minor cracks in addition to the major one. If, on the other hand, there is more than one severe crack, then the damage cannot, in general, be diagnosed with only three frequencies measurable. Nevertheless, a minimum number of cracks which are likely to be present in the structure can be established. Characteristic equations are developed in the form of linear systems for cantilever beam and general frame structures with multiple cracks. Usefulness of relative-frequency-change curves are demonstrated and rough guidelines are provided to aid the damage diagnosis process. Several numerical examples are included which illustrate the effect of multiple cracks on frequencies. (Author)

DESCRIPTORS: (U) *Diagnostic equipment, *Analog systems,

AD-A147 177

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

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*Circuits, *Cracks, Diagnosis(General),
Fracture(Mechanics), Frames, Structures, Damage,
Electrical properties, Linear systems

IDENTIFIERS: (U) WUAFOSR2307C2, PE81102F

AD-A147 184 20/5

NEW YORK UNIV NY DEPT OF CHEMISTRY

(U) Pulsed Laser Spectroscopic Study of the
Photoisomerization of Azo Labels at Three Different
Locations on a Polystyrene Chain.

84 7P

PERSONAL AUTHORS: Sung, C. S. P.; Gould, I. R.; Turro, N. J.

CONTRACT NO. AFOSR-81-0013, NSF-DMR82-05897

PROJECT NO. 2303

TASK NO. 82

MONITOR: AFOSR
TR-84-0893

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Macromolecules, v17 n8 p1447-
1451 1984.

Reprint: Pulsed Laser Spectroscopic Study of the
Photoisomerization of Azo Labels at Three Different
Locations on a Polystyrene Chain.

DESCRIPTORS: (U) *Pulsed lasers, *Spectroscopy,
Photochemical reactions, Isomerization, Labels,
Azobenzenes, Reprints

IDENTIFIERS: (U) PE81102F, WUAFOSR230382

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BRISTOL UNIV (ENGLAND) DEPT OF INORGANIC CHEMISTRY

COLUMBIA UNIV NEW YORK DEPT OF CHEMISTRY

(U) Synthesis and Molecular Structure of $(Au_3Ru_4(Micron_3-H)(CO)_{12}(PPh_3)_3)$.

(U) Methyl Salicylate Fluorescence as a Probe of the Geometry of Complexation to Cyclodextrins.

84

8P

84

5P

PERSONAL AUTHORS: Howard, J. A. K.; Slater, I. D.; Gordon, F.; Stone, A.;

PERSONAL AUTHORS: Cox, G. S.; Turro, N. J.;

CONTRACT NO. AFOSR-82-0070

CONTRACT NO. AFOSR-81-0013

PROJECT NO. 2303

PROJECT NO. 2303

TASK NO. B2

TASK NO. B2

MONITOR: AFOSR
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TR-84-0884

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SUPPLEMENTARY NOTE: Pub. in Polyhedron, v3 n5 p567-573 1984.

SUPPLEMENTARY NOTE: Pub. in Photochemistry and Photobiology, v40 n2 p185-188 1984.

Reprint: Synthesis and Molecular Structure of $(Au_3Ru_4(Micron_3-H)(CO)_{12}(PPh_3)_3)$.

Reprint: Methyl Salicylate Fluorescence as a Probe of the Geometry of Complexation to Cyclodextrins.

DESCRIPTORS: (U) *Synthesis(Chemistry), Ruthenium compounds, Carbonyl compounds, Complex compounds, Gold compounds, Molecular structure, Reprints

DESCRIPTORS: (U) *Fluorescence, *Salicylates, Probes, Molecular complexes, Geometry, Dextrins

IDENTIFIERS: (U) PE81102F, WJAFOSR2303B2

IDENTIFIERS: (U) *Methyl salicylates, Cyclodextrins, PE81102F, WJAFOSR2303B2

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI19B

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AD-A147 148 7/4 20/10

FLORIDA UNIV GAINESVILLE DEPT OF CHEMISTRY

FLORIDA UNIV GAINESVILLE DEPT OF CHEMISTRY

(U) Single Pulse Temperature Measurements in Flames by
Thermally Assisted Atomic Fluorescence Spectroscopy.

(U) Laser Excited Atomic Fluorescence Spectrometry with
Graphite Filament Atomization.

84

7P

84

8P

PERSONAL AUTHORS: Elder, M. L.; Zizak, G.; Bolton, D.;
Horvaths, J. J.; Winefordner, J. D.;

PERSONAL AUTHORS: Wittman, P.; Winefordner, J. D.;

CONTRACT NO. F49620-80-C-0005

CONTRACT NO. F49620-80-C-0005

PROJECT NO. 2303

PROJECT NO. F2303

TASK NO. A1

TASK NO. A1

MONITOR: AFOSR

MONITOR: AFOSR

TR-84-0896

TR-84-0899

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Applied Spectroscopy, v38 n2
p113-118 1984.

SUPPLEMENTARY NOTE: Pub. in Canadian Jnl. of Spectroscopy,
v29 n3 p75-78 1984. Abstract in French.

Reprint: Single Pulse Temperature Measurements in Flames
by Thermally Assisted Atomic Fluorescence Spectroscopy.

Reprint: Laser Excited Atomic Fluorescence Spectrometry
with Graphite Filament Atomization.

DESCRIPTORS: (U) *Temperature, *Measurement, *Atomic
spectroscopy, *Fluorescence, *Flames, Reprints

DESCRIPTORS: (U) *Laser induced fluorescence, *Atomic
spectroscopy, *Atomization, Excitation, Atomic properties,
Microcomputers, Control, Spectrometry, Figure of merit,
Precision, Sensitivity, Dynamic range, Detection,
Limitations, Sodium, Manganese, Tin, Quantum efficiency.
Reprints

IDENTIFIERS: (U) Thermometry, PE61102F, WUAFOSR2303A1

IDENTIFIERS: (U) Laser atomic fluorescence spectrometry,
PE61102F, WUAFOSR23003A1

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SEARCH CONTROL NO. EVI198

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ILLINOIS UNIV AT URBANA COORDINATED SCIENCE LAB

(U) Robust Redesign of Adaptive Control.

MAR 84

11P

PERSONAL AUTHORS: Ioannou, P. A. ; Kokotovic, P. V. ;

CONTRACT NO. AFOSR-78-3633

PROJECT NO. 2304

TASK NO. A8

MONITOR: AFOSR
TR-84-0866

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in IEEE Transactions on Automatic Control, VAC-29 n3 p202-211 Mar 84.

Reprint: Robust Redesign of Adaptive Control.

DESCRIPTORS: (U) *Computations, *Adaptive control systems, *Systems engineering, High frequency, Stability, Automatic, Reprints

IDENTIFIERS: (U) Robustness, WUAFOSR2304A8, PE81102F

20/1

12/1

MASSACHUSETTS INST OF TECH CAMBRIDGE LAB FOR INFORMATION AND DECISION SYSTEMS

(U) Application of the Schur Algorithm to the Inverse Problem for a Layered Acoustic Medium.

JUL 84

9P

PERSONAL AUTHORS: Yagle, A. E. ; Levy, B. C. ;

CONTRACT NO. AFOSR-82-0135

PROJECT NO. 2304

TASK NO. A1

MONITOR: AFOSR
TR-84-0865

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of the Acoustical Society of America, v76 n1 p301-308 Jul 84.

Reprint: Application of the Schur Algorithm to the Inverse Problem for a Layered Acoustic Medium.

DESCRIPTORS: (U) *Acoustics, *Plane waves, *Algorithms, Ocean bottom, Stress strain relations, Angle of arrival, Layers, Pulses, Schrodinger equation, Momentum, Theory, Reprints

IDENTIFIERS: (U) Layered media, Gelfand-Levitan theory, Schur algorithm, Acoustic media, Continuous media, Cholesky recursions, Impulse waves, Point sources, Fast algorithms, Spheric waves, WUAFOSR2304A1, PE81102F

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OKLAHOMA STATE UNIV STILLWATER DEPT OF CHEMISTRY

(U) Monte Carlo Transition-State Theory: XH(4) Yields XH(3)
+ H (X=C, Si).

JUL 84 6P

PERSONAL AUTHORS: Viswanathan, R. ; Raff, L. M. ; Thompson, D. L. ;

CONTRACT NO. AFOSR-82-0311

PROJECT NO. 2303

TASK NO. A2

MONITOR: AFOSR
TR-84-0857

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Chemical Physics, v81
n2 p628-632, 15 Jul 84.

Reprint: Monte Carlo Transition-State Theory: XH(4)
Yields XH(3) H (X=C, Si).

DESCRIPTORS: (U) *Monte Carlo method, *Silanes, *Methane,
Transitions, Theory, Reprints

IDENTIFIERS: (U) WUAFOSR2303A2, PE61102F

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UNCLASSIFIED

AD-A147 136 7/5 7/4

CHICAGO UNIV IL JAMES FRANCK INST

(U) Relaxation Dynamics of Photoexcited Benzene-Rare Gas
van der Waals Complexes,

AUG 84 21P

PERSONAL AUTHORS: Stephenson, T. A. ; Rice, S. A. ;

CONTRACT NO. F49620-83-C-0002

PROJECT NO. 2303

TASK NO. B1

MONITOR: AFOSR
TR-84-0851

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Chemical Physics, v81
n3 p1083-1101, 1 Aug 84.

Reprint: Relaxation Dynamics of Photoexcited Benzene-Rare
Gas van der Waals Complexes.

DESCRIPTORS: (U) *Photodissociation, *Relaxation,
*Benzene, *Rare gases, Molecular vibration, Molecular
association, Dynamics, Displacement, Nuclear structure,
Atoms, Polyatomic molecules, Interactions, Reaction
kinetics, Constants, Fluorescence, Spectra, Helium, Argon,
Neon, Reprints

IDENTIFIERS: (U) Van der Waals complexes, Van der Waals
forces, WUAFOSR2303B1, PE61102F

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AD-A147 127 20/4 21/5

STANFORD UNIV CA INFORMATION SYSTEMS LAB

MASSACHUSETTS INST OF TECH CAMBRIDGE GAS TURBINE AND PLASMA DYNAMICS LAB

(U) Studies in Statistical Signal Processing.

(U) Current Problems in Turbomachinery Fluid Dynamics.

DESCRIPTIVE NOTE: Annual scientific rept. 1 Jul 83-30 Jun 84.

DESCRIPTIVE NOTE: Semi-annual rept. 1 Nov 83-30 Apr 84.

AUG 84 9P

JUN 84 106P

PERSONAL AUTHORS: Kallath, T. ;

PERSONAL AUTHORS: Greitzer, E. M. ; Kerrebrock, J. L. ; Tompkins, W. T. , Jr. ; McCune, J. E. ; Epstein, A. H. ;

CONTRACT NO. AFOSR-83-0228

CONTRACT NO. F49620-82-K-0002

PROJECT NO. 2304

PROJECT NO. 2307

TASK NO. A6

TASK NO. A4

MONITOR: AFOSR TR-84-0868

MONITOR: AFOSR TR-84-0659

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) Several new results in the modeling, analysis and prediction of nonstationary second order processes have been developed. They include (1) the derivation of constant-parameter lattice filters for general nonstationary processes; (2) the development of fast algorithms for adaptive filtering with fixed-order transversal filters, including modifications necessary to ensure stability and convergence with finite precision computations; (3) the invention of a new adaptive beam-forming array for separating coherent (completely correlated) signals and interference. Two Ph.D theses have been completed during this period, H. Lev-Ari, 'Nonstationary Lattice-Filter Modeling', December 1983 and J. M. Cioffi, 'Fast Transversal Filters for Communications Applications', March 1984.

DESCRIPTORS: (U) *Signal processing, Stochastic processes, Adaptive filters, Algorithms, Beam forming, Least squares method

IDENTIFIERS: (U) Fast algorithms, Second order processes, PE61102F, WUAFOSR2304A6

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ABSTRACT: (U) A multi-investigator program on problems of current interest in turbomachinery fluid dynamics is being conducted at the MIT Gas Turbine and Plasma Dynamics Lab. Within the scope of this effort, four different tasks, encompassing both design and off-design problems, have been identified. These are: 1) Investigation of fan and compressor design point fluid dynamics (including formation of design procedures using current three-dimensional transonic codes and development of advanced measurement techniques for use in transonic fans); 2) Studies of basic mechanisms of compressor stability enhancement using compressor casing/hub treatment; 3) Fluid mechanics of inlet vortex flow distortions in gas turbine engines; and 4) Investigations of three-dimensional analytical and numerical computations of flows in highly loaded turbomachinery blading.

DESCRIPTORS: (U) *Transonic flow, *Axial flow compressors, *Gas turbines, Mathematical models, Turbomachinery, Fluid dynamics, Numerical methods and procedures, Stability, Vortices, Inlets, Distortion, Three dimensional flow, Fans, Blades, Compressor parts, Hubs, Turbine parts, Pressure distribution, Loads (Forces), Secondary flow, Subsonic flow, Supersonic flow

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

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IDENTIFIERS: (U) *Transonic compressors. Heavily loaded compressors, Inverse methods, Compressor casings. PE81102F, WJAFOSR2307A4

AD-A147 114 4/2 8/6

COLORADO STATE UNIV FORT COLLINS DEPT OF ATMOSPHERIC SCIENCE

(U) Plateau Effects on Diurnal Circulation Patterns,

APR 84 18P

PERSONAL AUTHORS: Reiter, E. R. ; Tang, M. ;

CONTRACT NO. DE-AC02-78EVO1340, AFOSR-82-0162

PROJECT NO. 2310

TASK NO. A1

MONITOR: AFOSR
TR-84-0852

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Monthly Weather Review, v112 n4 p638-651 Apr 84.

Reprint: Plateau Effects on Diurnal Circulation Patterns.

DESCRIPTORS: (U) *Convection(Atmospheric). *Plateaus. *Diurnal variations, Circulation, Barometric pressure, Thunderstorms, Jet streams, Air flow, Thickness, Earth atmosphere, United States, Reprints

IDENTIFIERS: (U) *Plateau circulation system, Great Basin, WJAFOSR2310A1, PE81102F

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI19B

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MARYLAND UNIV COLLEGE PARK DEPT OF COMPUTER SCIENCE

IDENTIFIERS: (U) WJAFOSR2304A7, PE61102F

(U) Debug Testing and Confidence Testing.

DESCRIPTIVE NOTE: Technical rept..

AUG 84

17P

PERSONAL AUTHORS: Hamlet, D. ;

REPORT NO. CS/E-84-004

CONTRACT NO. F49620-80-C-0004

PROJECT NO. 2304

TASK NO. A7

MONITOR: AFOSR
TR-84-0867

UNCLASSIFIED REPORT

ABSTRACT: (U) The strong point of computer program testing has always been failure. When a test fails, it is clear what to do, and this has led to the maximum that the goal of testing is finding faults. Testing theory, on the other hand, has tried to connect test success to program correctness. Call the kind of testing that seeks failures 'debug testing', and the other 'confidence testing'. A confidence-testing technique might in principle be used for debugging, but debugging tools cannot establish confidence. Debug testing is an activity intertwined with the whole of program development, and its theory must take account of this sociological context; debugging is a human craft. On the other hand, confidence testing theory may take program and test as given, without their human origins. Only by separating the two kinds of testing can reasonable goals be set for testing theory. The difference between debug- and confidence-testing theory is illustrated by detailed analysis of partition testing, and of experiments to validate debugging test tools. Goals for each kind of theory are proposed. Originator-supplied keywords include: Noise-rubbing effect, and probabilistic correctness.

DESCRIPTORS: (U) *Computer programs, *Confidence level, *Debugging(Computers), Error analysis, Test methods

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AD-A147 101

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CALIFORNIA UNIV LOS ANGELES DEPT OF CHEMISTRY AND
BIOCHEMISTRY

(U) Structural and Synthetic Organosilicon Chemistry.

DESCRIPTIVE NOTE: Final rept. 30 Jun 81-29 Jun 84.

JUL 84

18P

PERSONAL AUTHORS: Jung, M. E. ;

CONTRACT NO. AFOSR-81-0185

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR
TR-84-0856

UNCLASSIFIED REPORT

ABSTRACT: (U) The use of organosilicon compounds in synthesis is described. In particular the use of trimethylsilyl iodide, silyloxidines, and vinyl iodides are highlighted. Several structural organosilicon studies are also described. (Author)

DESCRIPTORS: (U) *Silicon compounds, *Organic compounds, *Synthesis (Chemistry), *Analytical chemistry, Chemical bonds, Methyl radicals, Iodides, Oxygen, Dienes, Vinyl radicals, Low temperature, Aldehydes, Condensation, Alkylation, Stereochemistry, Iodination, Hydrazones, Addition reactions, Hybridization, Reactivities, Resistance

IDENTIFIERS: (U) WUAFOSR2303B2, PE81102F

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TENNESSEE UNIV SPACE INST TULLAHOMA DEPT OF AEROSPACE
AND MECHANICAL ENGINEERING

(U) Contamination and Distortion of Steady Flow Field
Induced by Discrete Frequency in Aircraft Gas Turbines.

DESCRIPTIVE NOTE: Annual rept. 1 Jan-31 Dec 83.

MAY 84

20P

PERSONAL AUTHORS: Kurosaka, M. ;

CONTRACT NO. AFOSR-83-0049

PROJECT NO. 2307

TASK NO. A4

MONITOR: AFOSR
TR-84-0908

UNCLASSIFIED REPORT

ABSTRACT: (U) This annual technical report covers the first year, Phase I activity of a research program initiated in January 1, 1983. The main objective of the present program is to investigate the influence of Reynolds stresses of organized origin - induced by discrete frequency disturbances - in deforming and affecting the steady internal flow of aircraft engines. In particular, attention of the present research is focused upon the effect of orderly disturbances such as (A) the vortex whistle upon the Ranque-Hilsch effects and (B) Karman vortex street in causing temperature separation within the wake of bodies.

DESCRIPTORS: (U) *Steady flow, *Flow fields, *Aircraft engines, *Gas turbines, Contamination, Distortion, Reynolds number, Stresses, Anechoic chambers, Wind tunnels, Charts, Air Force research

IDENTIFIERS: (U) Ranque Hilsch effect, Reynolds stresses, Discrete frequency disturbance, PE81102F, WUAFOSR2307A4

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EV1198

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PURDUE UNIV LAFAYETTE IN THERMOPHYSICAL PROPERTIES
RESEARCH LAB

conductivity results could be obtained. The presence of a surface layer in which interconstituent thermal gradients are important and beyond which they are negligible was demonstrated. (Author)

(U) Thermophysical Property Testing Using Transient Techniques.

DESCRIPTORS: (U) *Thermophysical properties, *Solid rocket propellant binders, *Carbon carbon composites, Specific heat, Diffusivity, Thermal conductivity, HMX, RDX, Ammonium perchlorate, Polybutadiene, Energetic properties, Rocket nozzles, Single crystals, Powders, Mixtures, Isotropism, Carbon fibers, Matrix materials, Transients, Heat flux, Test methods, Solid rocket fuels

DESCRIPTIVE NOTE: Final scientific rept. 1 Feb 81-1 May 84.

JUN 84 52P

PERSONAL AUTHORS: Taylor, R. E.; Shoemaker, R. L.; Stark, J. A.; Keshigoe, L. G.;

IDENTIFIERS: (U) HTPB (Hydroxy Terminated Polybutadiene), PEB1102F, WUAFOSR2308A1

REPORT NO. TPRL-406

CONTRACT NO. F49620-81-K-0011

PROJECT NO. 2308

TASK NO. A1

MONITOR: AFOSR
TR-84-0889

UNCLASSIFIED REPORT

ABSTRACT: (U) Transient techniques were applied to the study of energetic materials (AP, HMX, RDX and HTPB) used in solid rocket fuel to carbon/carbon materials used as rocket nozzles. Studies on AP included single crystals, pressed powders and AP/HTPB mixtures. It was found that the conductivity of AP can be considered isotropic, even the orthorhombic phase. The conductivity values for pure AP calculated from the AP/HTPB mixtures were somewhat larger than those measured directly on single crystals due to imperfections in the relatively large single crystals. Conductivity values for Beta HMX obtained on pressed powders are believed to be 20% below those that would be obtained on good single crystals if they were available. Delta phase values are believed representative. Conductivity data useful for modeling AP/binder and HMX/binder fuel from RT to combustion were obtained. Successful techniques for determining in-situ conductivity values for carbon fibers and matrix in c/c composites were developed. The relative roles of the fibers and matrix in c/c subject to transient heat fluxes were delineated. The advantages of off-axis testing were revealed. Diffusivity values corresponding to thermal

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ILLINOIS UNIV AT CHICAGO CIRCLE STATISTICAL LAB

ROCKWELL INTERNATIONAL CANOGA PARK CA ROCKEYDYNE DIV

(U) A Complete Characterization of Triply Balanced Matrices with Applications to Survey Sampling.

(U) Reactions of Pentafluorotellurium Hypohalites with Fluoroolefins.

DESCRIPTIVE NOTE: Technical rept..

84 11P

AUG 84

PERSONAL AUTHORS: Shack, C.; Christie, K. O.;

PERSONAL AUTHORS: Hedayat, A.; Pesotan, H.;

CONTRACT NO. F49620-81-C-0020

REPORT NO. TR-84-5

PROJECT NO. 2303

CONTRACT NO. AFOSR-80-0170

TASK NO. 82

PROJECT NO. 2304

MONITOR: AFOSR
TR-84-0854

TASK NO. A5

UNCLASSIFIED REPORT

MONITOR: AFOSR
TR-84-0870

SUPPLEMENTARY NOTE: Pub. in Jnl. of Fluorine Chemistry, v24 p467-476, 1984.

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Prepared in cooperation with Guelph Univ., Ontario. Dept. of Mathematics and Statistics.

Reprint: Reactions of Pentafluorotellurium Hypohalites with Fluoroolefins.

ABSTRACT: (U) $R \times L$ triply balanced matrices arise in cross validation studies and in estimating the mean square errors of nonlinear statistics in many large scale survey samplings. It is shown that: (1) Any $R \times L$ triply balanced matrix and an orthogonal array $OA(R, L, 2, 3; \lambda)$ are one and the same object up to a possible notational change of the two symbols of the array to + and - respectively. (2) R is a multiple of 8 and $L < R = R/2$, and (3) The problem of the construction of $R \times L$ triply balanced matrices, $3 < R = L < R = R/2$, is completely resolved modulo the existence of Hadamard matrices of order $R/2$. (Author)

DESCRIPTORS: (U) *Matrices(Mathematics), Statistical samples, Statistical processes, Theorems

IDENTIFIERS: (U) Triply balanced matrices, Hadamard matrices, PE81102F, WUAFOSR2304A5

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A147 080

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ILLINOIS UNIV AT CHICAGO CIRCLE

(U) A Condition for the Validity of Fisher's Inequality.

84

6P

PERSONAL AUTHORS: Kageyama, S. ; Tsuji, T. ;

CONTRACT NO. AFOSR-78-3050

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR
TR-84-0913

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Japan Statistical Society, v14 n1 p85-88, 1984.

Reprint: A Condition for the Validity of Fisher's Inequality.

DESCRIPTORS: (U) *Inequalities, Test methods, Arrays, Symmetry. Experimental design, Japan, Reprints

IDENTIFIERS: (U) Fisher's inequality, Incomplete blocks, Block designs, Balanced arrays, Boundedness, Linked blocks, PE81102F, WJAFOSR2304A5

AD-A147 080

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AD-A147 077 4/2 8/8

COLORADO STATE UNIV FORT COLLINS DEPT OF ATMOSPHERIC SCIENCE

(U) Plateau Monsoons of the Northern Hemisphere: A Comparison between North America and Tibet.

APR 84 23P

PERSONAL AUTHORS: Tang, M. ; Reiter, E. R. ;

CONTRACT NO. AFOSR-82-0182, DE-AC02-76EVO1340

PROJECT NO. 2310

TASK NO. A1

MONITOR: AFOSR
TR-84-0853

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Monthly Weather Review, v112 n4 p817-837 Apr 84.

Reprint: Plateau Monsoons of the Northern Hemisphere: A Comparison between North America and Tibet.

DESCRIPTORS: (U) *Monsoons, *Plateaus, *China, *United States, Seasonal variations, Precipitation, Jet streams, Meteorological charts, Migration, Temperature, Reprints

IDENTIFIERS: (U) Planetary boundary layer, *Tibet, PE81102F, WJAFOSR2310A1

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OTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. EVI198

AD-A147 075 7/3 11/9

AD-A147 053 8/11

ROCKWELL INTERNATIONAL CANOGA PARK CA ROCKETDYNE DIV

RONDOUT ASSOCIATES INC STONE RIDGE NY

(U) Synthesis of Bis-Pentafluorotelluriumoxide
Fluorocarbons.

(U) Short Period Guided Waves Over Oceanic and Continental
Paths.

84 11P

DESCRIPTIVE NOTE: Quarterly research and development
status rept. no. 7, 1 Apr-31 Jul 84.

PERSONAL AUTHORS: Schack, C. J. ; Christie, K. O. ;

JUL 84 7P

CONTRACT NO. F49620-81-C-0020

PERSONAL AUTHORS: Pomeroy, P. W. ; Sutton, G. H. ;

PROJECT NO. 2303

CONTRACT NO. F49620-83-C-0017, ARPA Order-4493

TASK NO. B2

PROJECT NO. 2309

MONITOR: AFOSR

TR-84-0855

TASK NO. A1

UNCLASSIFIED REPORT

MONITOR: AFOSR

TR-84-0807

SUPPLEMENTARY NOTE: Pub. in Jnl. of Fluorine Chemistry,
v26 p19-28 1984.

UNCLASSIFIED REPORT

Reprint: Synthesis of Bis-Pentafluorotelluriumoxide
Fluorocarbons.

DESCRIPTORS: (U) *Synthesis(Chemistry); *Fluorinated
hydrocarbons; *Tellurium compounds; *Oxides, Olefin
polymers, Tetrafluoroethylene resins, Propenes, Ethylene,
Cyclic compounds, Fluoropolymers, Vibrational spectra,
Raman spectra, Reprints

IDENTIFIERS: (U) *Fluorocarbons, Tellurium oxide/bis-
pentafluoro, Xenon tellurium oxide/bis-pentafluoro,
Fluoroolefins, Xenon compounds, PE81102F, WJAFOSR230382

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ABSTRACT: (U) Task A: 1--Evaluate the usefulness of Pg
and Lg to estimate yield for Eurasian and Africa events,
2--Investigate possible caused of amplitude variation (i.
e. source and recording site geology), and 3--Analyze the
regional phases for use in discrimination and yield
estimation; Task B: 1--Continue the analysis of data from
Wake Island Hydrophone Array in cooperation with
personnel at Hawaii Inst. of Geophysics and assist in
guiding the operation of the array, 2--Conduct
comparative studies of (long-range) oceanic Pn/Sn and
continental Lg (Pg) using, especially, data from the
Catskill Seismic Array and the Wake Array, in comparison
with theoretical seismograms for different source types,
focal depth, and velocity structures, and 3--Evaluate the
Wake and Catskill Arrays in terms of signal coherence and
detection capability, also compare them with other high
quality continental stations and the DARPA/NORDA MSS;
Task C: 1--Install, maintain, and operate high quality
three component broad band digital seismographs in the
Stone Ridge, NY area, and 2--Development analysis
techniques and software to obtain source and propagation
path characteristics from broad band three component
digital data.

DESCRIPTORS: (U) *Seismic waves, Discrimination, Yield,
Estimates, Wave propagation, Amplitude, Seismic arrays,

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI19B

AD-A147 053 CONTINUED

AD-A147 052 12/1

Geology, Eurasia, Africa, Oceans, Paths, Seismic data
IDENTIFIERS: (U) Continents, PEG1102F, WUAFOSR2309A1

CALIFORNIA UNIV SANTA BARBARA DEPT OF ELECTRICAL AND
COMPUTER ENGINEERING

(U) Techniques for Vector Quantization.

DESCRIPTIVE NOTE: Final rept. 1 Oct 82-30 Sep 83.

AUG 84 11P

PERSONAL AUTHORS: Gersho, A. ;

CONTRACT NO. AFOSR-82-0008

PROJECT NO. 2304

TASK NO. A6

MONITOR: AFOSR
TR-84-0897

UNCLASSIFIED REPORT

ABSTRACT: (U) The second year of AFOSR support at the University of California, Santa Barbara has allowed us to make significant strides in exploring the potential of vector quantization for source coding. Some of this work is described in the attached list of references. Some of the studies were completed, including predictive vector quantization and rate distortion modeling of speech using a composite source model to obtain rate distortion bounds on performance of vector quantization. Particularly important results in the second year include the development of a new family of fast search algorithms for pattern matching and the development of Hierarchical Vector Quantization. Several other promising studies, including compander/lattice coding, were still in progress when the grant terminated. (Author)

DESCRIPTORS: (U) *Vector analysis, Quantization, Algorithms, Distortion, Rates, Coding

IDENTIFIERS: (U) Fast algorithms

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AD-A147 045 20/10 7/4 7/3

AD-A147 035 20/10 4/1

TEXAS UNIV AT AUSTIN DEPT OF CHEMISTRY

NATIONAL BUREAU OF STANDARDS GAITHERSBURG MD QUANTUM
CHEMISTRY GROUP

(U) MNDX Study of Sn2 Reactions and Related Processes.

84 10P

(U) Application of Quantum Chemistry of Atmospheric
Chemistry.

PERSONAL AUTHORS: Carrion, F. ; Devar, M. J. S. ;

DESCRIPTIVE NOTE: Annual rept. 1 Oct 83-30 Sep 84.

CONTRACT NO. F49620-83-C-0024

SEP 84 15P

PROJECT NO. 2303

PERSONAL AUTHORS: Krauss, M. ; Stevens, W. J. ;

TASK NO. B2

CONTRACT NO. AFOSR-ISSA-83-00008

MONITOR: AFOSR

PROJECT NO. 2301

TR-84-090S

TASK NO. A4

UNCLASSIFIED REPORT

MONITOR: AFOSR

TR-84-0860

SUPPLEMENTARY NOTE: Pub. in Jnl. of American Chemical
Society, v108 n12 p3531-3539 1984.

UNCLASSIFIED REPORT

Reprint: MNDX Study of Sn2 Reactions and Related
Processes.DESCRIPTORS: (U) *Reaction kinetics, *Anions, *Molecular
energy levels, *Aliphatic compounds, *Quantum theory,
Vapor phases, Activation, Barriers, Solutions(General),
Solvation, Chlorides, Methyl radicals, Alkyl radicals,
Benzyl radicals, Acetaldehyde, Nucleophilic reactions,
Substitution reactions, ReprintsIDENTIFIERS: (U) MNDX(Modified Neglect of Differential
Overlap), Allyl radicals, PE81102F, WJAFOSR2303182ABSTRACT: (U) Relativistic effective potentials have
been generated for a number of relevant metals such as
iron, neodymium, and uranium and applied to calculations
of the oxide electronic states including intermediate
coupling calculations of the spin-orbit interaction.
(Author)DESCRIPTORS: (U) *Quantum chemistry, *Atmospheric
chemistry, *Metal compounds, *Oxides, *Electronic states,
Iron oxides, Neodymium compounds, Uranium compounds,
Coupling(Interaction), Spin states, Molecular orbitals,
Energetic properties, Spectroscopy, Models, Solar
radiation, Valence, Cations, Pumping, Vibration, High
temperature, Infrared spectra, Absorption spectraIDENTIFIERS: (U) REP(Relativistic Effective Potentials),
PE81102F, WJAFOSR2301A4

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AD-A147 032 8/11

HOWARD UNIV WASHINGTON DC SOLID STATE LAB

ROYAL NORWEGIAN COUNCIL FOR SCIENTIFIC AND INDUSTRIAL
RESEARCH KJELLER

(U) Development of Short Gate FET's.

DESCRIPTIVE NOTE: Final rept. Jun 81-Jul 84.

(U) Deployment of a Regional Array in Norway.

DESCRIPTIVE NOTE: Semi-annual technical rept. 1 Jan-30
Jun 84.

JUL 84 118P

PERSONAL AUTHORS: Spencer, M. G.; Harris, G. L.; Haynes, R.;

JUL 84 17P

CONTRACT NO. AFOSR-81-0223

PERSONAL AUTHORS: Mykkeltveit, S.;

PROJECT NO. 2305

CONTRACT NO. F49820-84-C-0013, ARPA Order-4950

TASK NO. C1

PROJECT NO. 2309

MONITOR: AFOSR

TASK NO. A1

TR-84-0833

MONITOR: AFOSR
TR-84-0908

UNCLASSIFIED REPORT

ABSTRACT: (U) The goal of this work was to investigate the performance limit of the standard GaAs FET structure. During the contract period we have constructed an AsC13 epitaxial system used to provide buffer layers for our FET structures. We have developed a submicron lithographic process using deep U.V. techniques and, using these techniques we have produced working .5 micron gate devices. In addition, we have investigated the 'gettering' of substrates as a technique to improve the mobility of ion implanted layers. The result of this experiment showed a correlation between hall mobilities and gettered substrates. Finally, a investigation of a self aligned source drain structure has commenced and several theoretical studies are reported. (Author)

DESCRIPTORS: (U) *Field effect transistors, *Gates(Circuits), *Lithography, *Gallium arsenides, *Epitaxial growth, Structural properties, Schottky barrier devices, Ion implantation, Submillimeter waves, Short range(Distance), Gettering, Molecular beams, Theory, High rate, Buffers, Ion implantation, Hall effect, Q band, Sources, Ultraviolet radiation, Layers, Space charge, Substrates, Chromium, Fabrication

IDENTIFIERS: (U) Submicron devices, Arsenic trichloride, Short gates, MBE(Molecular Beam Epitaxy), Buffer layers, Source structures, Hall mobility, Fabrication speeds, Drain structures, PE61102F, WUAFOSR2305C1

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UNCLASSIFIED REPORT

ABSTRACT: (U) The purpose of the development of an experimental regional array in Norway is to take advantage of the extremely good propagation of high-frequency energy for regional seismic phases in Eurasia. Since Norway is located within the same geologic plate boundary as the Soviet Union, the deployment of such an array in Norway will provide important new insight with respect to the projected performance of possible future in-country stations in the U.S.S.R.

DESCRIPTORS: (U) *Seismic waves, USSR, Wave propagation, Geologic models, Norway, Energy, High frequency

IDENTIFIERS: (U) PE61102F, WUAFOSR2309A1

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A147 011 CONTINUED

AD-A147 011 8/11 20/14

ROCKWELL INTERNATIONAL THOUSAND OAKS CA SCIENCE CENTER

(U) Nonlinear Wave Propagation Study.

DESCRIPTIVE NOTE: Semi-annual technical rept. no. 2, 1
Dec 83-31 May 84.

MAY 84 21P

PERSONAL AUTHORS: Tittmann, B. R. ;

REPORT NO. SC5261.85AR

CONTRACT NO. F49620-83-C-0065, DARPA Order-4400

PROJECT NO. 3A10

TASK NO. 03

MONITOR: AFOSR
TR-84-0878

UNCLASSIFIED REPORT

ABSTRACT: (U) At the present time there still exists an element of uncertainty regarding the definition of an effective radius, which can be used to separate the nonlinear near-field regime adjacent to an explosion from the linear far-field seismic regime. This report presents results of a study of the response of Westerly granite to sinusoidal loading. The amplitude of transition from linearity to non-linearity can be defined. Results are compared to previous studies. Nonlinear effects were observed in a cylindrical test specimen of Westerly granite which was subjected to both flexural and torsional modes of resonant vibration. Nonlinear effects in shear are observed when the shearing strain exceeds approximately 0.000001, increasing slightly with increasing effective pressure. Nonlinear effects in flexure are also observed when the extension/compression strain exceeds 0.000001, also increasing very slightly with increasing effective pressure. These transition amplitudes probably represent a lower limit on the amplitude of transition from linear to nonlinear behavior for the primary elastic pulse propagating in the near-field of an explosion. Using these measurements it is not possible to determine whether the nonlinear effects observed in flexure are primarily an extensional or compressional feature. This is a critical issue and in

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future studies we will attempt to examine the constitutive properties of rocks in both tension and compression under moderate to low amplitude conditions.

DESCRIPTORS: (U) *Linear systems, *Seismic waves, *Wave propagation, Explosion effects, Compression, Strain(Mechanics), Flexural properties, Rock

IDENTIFIERS: (U) PE82714E

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A147 002

7/2

BRISTOL UNIV (ENGLAND) DEPT OF INORGANIC CHEMISTRY

(U) Replacement of Hydrido-Ligands in Triruthenium Complexes by Triphenylphosphinegold Groups. Crystal Structures of $(\text{AuRu}_3-(\mu\text{-COMe})(\text{CO})_{10}(\text{PPh}_3))$, $(\text{AuRu}_3(\mu\text{-H})_2(\mu_3\text{-COMe})(\text{CO})_9(\text{PPh}_3))$, and $(\text{Au}_3\text{Ru}_3(\mu_3\text{-COMe})(\text{CO})_9(\text{PPh}_3)_3)$.

83

11P

PERSONAL AUTHORS: Bateman, L. W.; Green, M.; Mead, K. A.; Mills, R. M.; Salter, I. D.;

CONTRACT NO. AFOSR-82-0070

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR
TR-84-0895

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of the Chemical Society, Dalton Transactions, p2599-2608 1983.

Reprint: Replacement of Hydrido-Ligands in Triruthenium Complexes by Triphenylphosphinegold Groups. Crystal Structures of $(\text{AuRu}_3-(\mu\text{-COMe})(\text{CO})_{10}(\text{PPh}_3))$, $(\text{AuRu}_3(\mu\text{-H})_2(\mu_3\text{-COMe})(\text{CO})_9(\text{PPh}_3))$, and $(\text{Au}_3\text{Ru}_3(\mu_3\text{-COMe})(\text{CO})_9(\text{PPh}_3)_3)$

DESCRIPTORS: (U) *Ruthenium compounds, *Complex compounds, *Crystal structure, Phosphine, Carbonyl compounds, Reprints

IDENTIFIERS: (U) PE81102F, WJAFOSR230382

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AD-A148 995 20/8 7/4 7/3 20/10

CHICAGO UNIV IL JAMES FRANCK INST

(U) Vibrational State Dependence of Radiationless Processes in 18(2 Micrometers) Benzene.

AUG 84 12P

PERSONAL AUTHORS: Stephenson, T. A.; Rice, S. A.;

CONTRACT NO. F49620-83-C-0002

PROJECT NO. 2303

TASK NO. B1

MONITOR: AFOSR
TR-84-0850

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Chemical Physics, v81 n3 p1073-1082, 1 Aug 84.

Reprint: Vibrational State Dependence of Radiationless Processes in 18(2 Micrometers) Benzene.

DESCRIPTORS: (U) *Benzene, *Electronic states, *Molecular vibration, Molecular energy levels, Laser induced fluorescence, Supersonic flow, Jet flow, Cooling, Reaction kinetics, Constants, Room temperature, Vapor phases, Decay, Vibrational spectra, Excitation, Quantum chemistry, Yield, Molecule molecule interactions, Reprints

IDENTIFIERS: (U) PE81102F, WJAFOSR230381

UNCLASSIFIED

OTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. EVI198

AD-A146 977

12/1

JOHNS HOPKINS UNIV BALTIMORE MD DEPT OF MATHEMATICAL SCIENCES

(U) Combined Nonparametric Inference and State Estimation for Mixed Poisson Processes.

84 17P

PERSONAL AUTHORS: Karr, A. F. ;

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR
TR-84-0883

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Zeitschrift fuer Wahrscheinlichkeitstheori und Verwandte Gebiete, v88 p81-96 1984.

Reprint: Combined Nonparametric Inference and State Estimation for Mixed Poisson Processes.

DESCRIPTORS: (U) *Estimates, *Poisson density functions, Laplace transformation

IDENTIFIERS: (U) Poisson processes, Nonparametric estimation, Compact spaces, Mixed poisson processes, Cox processes, WUAFOSR2304A5, PE81102F

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AD-A146 969

12/1

NORTH CAROLINA UNIV AT CHAPEL HILL DEPT OF STATISTICS

(U) Analytic and Sequential Feynman Integrals on Abstract Wiener and Hilbert Spaces, and A Cameron-Martin Formula. Revision.

DESCRIPTIVE NOTE: Technical rept.,

JAN 84 43P

PERSONAL AUTHORS: Kallianpur, G. ; Kannan, D. ; Karandikar, R. L. ;

REPORT NO. TR-53

CONTRACT NO. F49620-82-C-0009

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR
TR-84-0863

UNCLASSIFIED REPORT

ABSTRACT: (U) Sequential Feynman Integrals are defined for classes of functions on a Hilbert space and on an abstract Wiener space. A Cameron-Martin formula is proved for analytic and sequential Feynman integrals for two classes.

DESCRIPTORS: (U) *Stochastic processes, Integral equations, Hilbert space, Theorems

IDENTIFIERS: (U) Abstract Wiener space, Feynman integrals, PE81102F, WUAFOSR2304A5

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OTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A146 967 20/4 12/1 21/5
SCIENTIFIC RESEARCH ASSOCIATES INC GLASTONBURY CT

(U) Development of a Navier-Stokes Rotor/Stator Analysis.
DESCRIPTIVE NOTE: Annual rept. 21 Jun 83-30 Jun 84.

JUN 84 39P

PERSONAL AUTHORS: Shamroth, S. J.; McDonald, H.; Weinberg, B.
C.; Roscoe, D. V.;

REPORT NO. SRA-R84-910004-1

CONTRACT NO. F49620-83-C-0119

PROJECT NO. 2307

TASK NO. A4

MONITOR: AFOSR
TR-84-0858

UNCLASSIFIED REPORT

ABSTRACT: (U) An important problem in axial flow turbomachinery is that of flow through a turbine or compressor stage in which interaction occurs between the rotor and the stator. Although several experimental efforts have focused upon this problem, relatively little analysis has been applied to this problem. The present effort applies a Navier-Stokes analysis to the rotor/stator problem. The effort consists of several tasks. These include assessment of an existing Navier-Stokes analysis for time-dependent flows, exploration of appropriate boundary conditions, development of an appropriate coordinate system and a demonstration calculation. The present annual report discusses the time-dependent assessment, exploration of boundary conditions and the coordinate system problem.

DESCRIPTORS: (U) *Axial flow, *Navier stokes equations, *Rotors, *Stators, Boundary value problems, Time dependence

IDENTIFIERS: (U) PE61102F, WUAFOSR2307A4

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AD-A146 964 20/4
MCDONNELL DOUGLAS CORP LONG BEACH CA

(U) Some Important Problems in Unsteady Boundary Layers Including Separation. II. Unsteady Boundary Layers Close to the Stagnation Region of Slender Bodies.

DESCRIPTIVE NOTE: Annual rept. 15 Mar 83-14 Mar 84.

JUN 84 39P

PERSONAL AUTHORS: Cebeci, T.; Stewartson, K.; Schimke, S. M.

REPORT NO. MDC-J3527

CONTRACT NO. F49620-82-C-0055

PROJECT NO. 2307

TASK NO. A2

MONITOR: AFOSR
TR-84-0861

UNCLASSIFIED REPORT

ABSTRACT: (U) The evolution of unsteady boundary layers on the plane of symmetry of a slender prolate spheroid in uniform motion at constant angle of attack after an impulsive start has been studied for the case of prescribed pressure distribution. Calculated results have been obtained for angles of attack ranging from 30 degrees to 50 degrees and show, for example, that the unsteady-state solutions approach the steady-state solutions rapidly on the windward and leeward sides for $\alpha <$ and α sub c (approximately - 41 degrees). This is also so on the windward side for $\alpha >$ α sub c. On the leeward side for $\alpha >$ and α sub c, however, the unsteady boundary layer is initially unseparated but develops a region of reversed flow with increasing time. Subsequently, the streamwise displacement thickness develops a pronounced peak which leads to a singularity of the type observed by van Dommelen and Shen on a circular cylinder started impulsively from rest. (Author)

DESCRIPTORS: (U) *Boundary layer, *Unsteady flow, Flow separation, Turbulent boundary layer, Helicopter rotors, Rotor blades (Rotary wings), Stagnation, Angle of attack

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A146 964 CONTINUED

AD-A146 963 12/1 9/4

CALIFORNIA UNIV BERKELEY

IDENTIFIERS: (U) Prolate spheroid, PE81102F,
WJAFOSR2307A2

(U) A Bayesian Lady Tasting Tea,

84 28P

PERSONAL AUTHORS: Lindley, D. V. ;

CONTRACT NO. AFOSR-81-0122

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR
TR-84-0921

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Proceedings of Anniversary
Conference, Statistics: An Appraisal (50th), p455-479
1984.

Reprint: A Bayesian Lady Tasting Tea.

DESCRIPTORS: (U) *Probability, *Information theory,
Legendre functions, Test methods, Errors, Reprints

IDENTIFIERS: (U) Significance tests, Bayesian analysis,
Likelihoods, Prior probabilities, Maximum likelihood,
Posterior probabilities, Shannon information, PE81102F,
WJAFOSR2307A5

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A146 962 17/2 9/4

AD-A146 980 9/2 12/1

CALIFORNIA UNIV SANTA BARBARA DEPT OF ELECTRICAL AND
COMPUTER ENGINEERING

MASSACHUSETTS UNIV AMHERST DEPT OF ELECTRICAL AND
COMPUTER ENGINEERING

(U) Pitch Synchronous Transform Coding of Speech at 9.6 Kb/
s Based on Vector Quantization,

(U) A Multiprocessor Network Suitable for Single-Chip VLSI
Implementation,

MAY 84 5P

84 12P

PERSONAL AUTHORS: Shoham, Y. ; Garsho, A. ;

PERSONAL AUTHORS: Samatham, M. R. ; Pradhan, D. K. ;

CONTRACT NO. AFOSR-82-0008

CONTRACT NO. AFOSR-84-0052

PROJECT NO. 2304

PROJECT NO. 2304

TASK NO. A6

TASK NO. A6

MONITOR: AFOSR
TR-84-0873

MONITOR: AFOSR
TR-84-0885

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in IEEE International Conference
on Communications, p1179-1182 May 84.

SUPPLEMENTARY NOTE: Pub. in IEEE Proceedings of Annual
International Symposium on Computer Architecture, p328-
337 1984.

Reprint: Pitch Synchronous Transform Coding of Speech at
9.6 Kb/s Based on Vector Quantization.

Reprint: A Multiprocessor Network Suitable for Single-
Chip VLSI Implementation.

DESCRIPTORS: (U) *Speech, *Coding, Signal to noise ratio,
Segmented, Reprints

DESCRIPTORS: (U) *Computer architecture,
*Multiprocessors, *Networks, *Computations,

IDENTIFIERS: (U) Pitch coding, Synchronous coding,
Transform coding, Vector quantization, Burst coding,
Pitch coding, Block coding. PE81102F, WUAFOSR2304A6

Chips(Electronics), Installation, Algorithms, Air Force
research, Reprints

IDENTIFIERS: (U) VLSI(Very Large Scale Integration),
PE81102F, WUAFOSR2304A6

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A146 942 12/1

AD-A146 941 9/3 12/1

CLARKSON COLL OF TECHNOLOGY POTSDAM NY DEPT OF
MATHEMATICS AND COMPUTER SCIEN

CONNECTICUT UNIV STORRS DEPT OF ELECTRICAL ENGINEERING
AND COMPUTER SCIENCE

(U) On the Inverse Scattering Transform of
Multidimensional Nonlinear Equations Related to First-
Order Systems in the Plane.

(U) Dual Adaptive Control Based upon Sensitivity Functions.

AUG 84 13P

84 7P

PERSONAL AUTHORS: Fokas, A. S. ; Ablowitz, M. J. ;
Y. ; Molusis, J. A. ; Mookerjee, P. ; Bar-Shalom,

CONTRACT NO. AFOSR-78-3874

CONTRACT NO. AFOSR-80-0098

PROJECT NO. 2304

PROJECT NO. 2304

TASK NO. A4

TASK NO. A1

MONITOR: AFOSR
TR-84-0920

MONITOR: AFOSR
TR-84-0888

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Mathematics and
Physics, v25 n8 p2494-2505 Aug 84.

ABSTRACT: (U) A new adaptive dual control solution is
presented for the control of a class of multivariable
input-output systems. Both rapidly varying random
parameters and constant but unknown parameters are
included. The new controller modifies the cautious
control design by numerator and denominator correction
terms. This controller is shown to depend upon
sensitivity functions of the expected future cost. A
scalar example is presented to provide insight into the
properties of the new dual controller. Monte-Carlo
simulations are performed which show improvement over the
cautious controller and the Linear Feedback Dual
Controller of two previous publications. (Author)

Reprint: On the Inverse Scattering Transform of
Multidimensional Nonlinear Equations Related to First-
Order Systems in the Plane.

DESCRIPTORS: (U) *Nonlinear algebraic equations,
*Inverse scattering, Problem solving, Boundary value
problems, Integral equations, Nonlinear differential
equations, Reprints

IDENTIFIERS: (U) WUAFOSR2304A4, PE81102F

DESCRIPTORS: (U) *Adaptive control systems,
*Multivariate analysis, *Input output devices,
Sensitivity, Parameters, Algorithms, Monte Carlo method,
Random variables, Stochastic processes, Computations

IDENTIFIERS: (U) WUAFOSR2304A1, PE81102F

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DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. EVI198

AD-A146 938 14/5 9/4

AD-A146 929 12/1

PENNSYLVANIA STATE UNIV
ELECTRICAL ENGINEERING

CALIFORNIA UNIV SANTA BARBARA DEPT OF ELECTRICAL AND
COMPUTER ENGINEERING

(U) White-Light Optical Information Processing and
Holography.

(U) Fast Search Algorithms for Vector Quantization and
Pattern Matching.

DESCRIPTIVE NOTE: Annual rept. 15 Mar 83-14 Mar 84.

84 5P

JUN 84 64P

PERSONAL AUTHORS: Yu, F. T. S. ;
Shoham, Y. ;

PERSONAL AUTHORS: Cheng, D. Y. ; Gersho, A. ; Ramamurthi, B. ;

CONTRACT NO. AFOSR-83-0140

CONTRACT NO. AFOSR-82-0008

PROJECT NO. 2305

PROJECT NO. 2304

TASK NO. B1

TASK NO. A6

MONITOR: AFOSR

MONITOR: AFOSR
TR-84-0874

MONITOR: AFOSR
TR-84-0889

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in IEEE, p9.11.1-9.11.4 1984.

ABSTRACT: (U) Progress has been made on the white-light optical information processing and holography research program. Work was completed on a broad band color image deblurring and this technique was extended to the restoration of 2-D out-of-focused color photographic images. A new technique of white-light density pseudocolor encoder was developed for three primary colors. This white-light pseudocolor encoder is very cost effective and offers a high image resolution, which would be an excellent alternative for the digital counterpart. We have also in this period conducted a measuring technique for the degree of coherence in the Fourier plane of the grating-based white-light signal processor. We have shown that high degree of coherence is achievable with a signal sampling grating at the input plane. Thus the white-light technique is capable of processing the information in complex amplitude and it is very suitable for color signal processing. In this phase of research we have also studied the effect of coherence due to source encoding, signal sampling and spectral band filtering, as applied to the white-light signal processing.

DESCRIPTORS: (U) *Signal processing, *Holography, *Information processing, Image processing, Photographic images, Colors, Coding, Sampling, Band spectra, Optical processing, White light

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A148 927 12/1

AD-A148 923 9/2

BROWN UNIV PROVIDENCE RI LEFSCHETZ CENTER FOR DYNAMICAL SYSTEMS

MARYLAND UNIV COLLEGE PARK DEPT OF COMPUTER SCIENCE

(U) Numerical Methods and Approximation and Modelling Problems in Stochastic Control Theory.

(U) Functional Semantics of Modules.

DESCRIPTIVE NOTE: Technical rept.,

DESCRIPTIVE NOTE: Interim rept. 1 Jan-30 Jun 84.

SEP 84 19P

AUG 84 8P

PERSONAL AUTHORS: Fleming, W. H. ; Kushner, H. J. ;

PERSONAL AUTHORS: Gannon, J. ; Hamlet, D. ; Mills, H. ;

PERSONAL AUTHORS: Fleming, W. H. ; Kushner, H. J. ;

REPORT NO. CS/E-84-005

CONTRACT NO. AFOSR-81-0118

CONTRACT NO. F49620-80-C-0004

PROJECT NO. 2304

PROJECT NO. 2304

TASK NO. A1

TASK NO. A7

MONITOR: AFOSR

MONITOR: AFOSR
TR-84-0879

UNCLASSIFIED REPORT

ABSTRACT: (U) Research during this period continued in the following topic areas: (1) Nonlinear filtering; (2) Large deviations problems; (3) Stochastic control of piecewise-deterministic processes; (4) Stochastic variational calculus; (5) Approximating multiple Itô integrals with band-limited processes; (6) Large deviations methods and asymptotic properties of recursive algorithms; and (7) Approximation and modelling for distributed stochastic systems. Progress is summarized and a list of publications supported by the grant is included in the report. (Author)

DESCRIPTORS: (U) *Numerical methods and procedures. *Control theory. *Stochastic control. *Mathematical models. Approximation(Mathematics), Mathematical filters. Nonlinear systems. Recursive functions, Integrals, Asymptotic series

IDENTIFIERS: (U) PE81102F, WUAFOSR23034A1

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UNCLASSIFIED REPORT

ABSTRACT: (U) Because large-scale software development is a struggle against internal program complexity, the modules into which programs are divided play a central role in software engineering. A module encapsulating a data type allows the programmer to ignore both the details of its operations, and of its value representations. It is a primary strength of program proving that as modules divide a program, making it easier to understand so do they divide its proof. Each module can be verified in isolation, then its internal details ignored in a proof of its use. This paper describes proofs of module abstractions based on the functional method of Mills, and contrasts this with the Alperd formalism based on Hoare logic. (Author)

DESCRIPTORS: (U) *Computer programming. *Modules(Electronics). *Semantics, Computer programs. Encapsulation, Systems engineering. Value, Computer logic

IDENTIFIERS: (U) PE81102F, WUAFOSR2304A7

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A146 909 20/3 11/3 AD-A146 909 CONTINUED

ROCKWELL INTERNATIONAL THOUSAND OAKS CA
MICROELECTRONICS RESEARCH AND DEVELOPMENT CENTER

(U) Research on Electroluminescence in Thin Film Yttrium
Oxysulfide.

IDENTIFIERS: (U) Yttrium oxysulfide, PE81102F,
WUAFOSR2306B1

DESCRIPTIVE NOTE: Final rept. 1 Jun 81-15 Sep 83.

AUG 84 54P

PERSONAL AUTHORS: Ketchpel, R. D.; Hale, L. G. ;

REPORT NO. MRDC41090.3FR

CONTRACT NO. F49620-81-C-0069

PROJECT NO. 2306

TASK NO. 81

MONITOR: AFOSR
TR-84-0891

UNCLASSIFIED REPORT

ABSTRACT: (U) Thin films of a rare-earth oxysulfide phosphor, yttrium oxysulfide:europium, were evaluated for use in a thin film electro-luminescent emitter (TFEL). For the first time, emission typical of the rare earth activator was observed in a rare earth host TFEL emitter. The films were characterized for optical spectrum, brightness-voltage characteristic, photoluminescence, crystal structure, and compared to efficient cathodoluminescent powder phosphors. Yttrium oxysulfide:europium, as well as high efficiency TFEL emitters of zinc sulfide:manganese. The E-beam deposited films exhibited considerable photoluminescence and cathodoluminescence after a high temperature anneal (800 C). However, the anneal induced cracks in the phosphor film, which in turn limited the maximum applied voltage and electroluminescent brightness to less than 1 ft-L. Alternate substrate materials and process schedules minimized the cracking, but did not eliminate this fundamental problem.

DESCRIPTORS: (U) *Electroluminescence, *Thin films, *Yttrium compounds, *Sulfides, Substrates, Voltage, Phosphors, Crystal structure, Annealing, Cracks, Deposition, Rare earth compounds, Emitters

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SEARCH CONTROL NO. EVI198

AD-A148 894

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AD-A148 890 9/2 5/10

FLORIDA UNIV GAINESVILLE DEPT OF CHEMISTRY

OHIO STATE UNIV RESEARCH FOUNDATION COLUMBUS

(U) Determination of Trace Alkali and Alkaline Earth Metals in Orange Juice Using the DC Plasma and the Inductively Coupled Plasma Atomic Emission Techniques.

(U) Distributed Knowledge Base Systems for Diagnosis and Information Retrieval.

DESCRIPTIVE NOTE: Annual rept. 1 Jul 83-30 Jun 84.

84 11P

AUG 84 115P

PERSONAL AUTHORS: McHard, J. A.; Twigg, K. M.; Bach, D. T.; Winefordner, J. D.;

PERSONAL AUTHORS: Chandrasekaran, B.;

CONTRACT NO. F49620-80-C-0005

CONTRACT NO. AFOSR-82-0255

PROJECT NO. 2303

PROJECT NO. 2304

TASK NO. A1

TASK NO. A7

MONITOR: AFOSR
TR-84-0800

MONITOR: AFOSR
TR-84-0884

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Spectroscopy Letters, v17(485) p287-294 1984.

Reprint: Determination of Trace Alkali and Alkaline Earth Metals in Orange Juice Using the DC Plasma and the Inductively Coupled Plasma Atomic Emission Techniques.

ABSTRACT: (U) During the year progress was made in a number of directions: (1) The investigators developed in significant detail a language for representing an agent's understanding of aspects of how a device works, and also developed a compiler which can produce a diagnostic expert problem solving system from this deep level functional representation. (2) The researchers continued their investigation of how design knowledge can be organized as plans and design problem solving can be viewed as design refinement by plan selection and redesign. They have completed the construction of a prototype design expert system called AIR-CYL, which designs a moderately complex mechanical component called an air cylinder for a range of specifications. (3) They continued investigation of high-level languages for expert system construction; in particular they have refined their design of the CSRL language for diagnostic expert system, and implemented it in Interlisp for the Xerox family of Lisp machines. (4) They have initiated a new investigation in reasoning about the behavior of physical systems by qualitative simulation by using a novel technique called consolidation, which infers the behavior of a composite component from the behaviors of its subcomponents.

DESCRIPTORS: (U) *Information processing, *Information retrieval, *Problem solving, Systems engineering, High

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A146 890 CONTINUED

AD-A146 888 12/1

level languages, Computer aided diagnosis, Computer aided design, Hierarchies, Artificial intelligence, Reasoning, Behavior, Planning, Selection

JOHNS HOPKINS UNIV BALTIMORE MD DEPT OF MATHEMATICAL SCIENCES

(U) Estimation and Reconstruction for Zero-One Markov Processes.

IDENTIFIERS: (U) CSRL(Conceptual Structures Representation Languages), PEB1102F, WUAFOSR2304A7

84 38P

PERSONAL AUTHORS: Karr, A. F. ;

CONTRACT NO. AFOSR-82-0029

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR
TR-84-0884

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Stochastic Processes and their Applications, v18 p219-255 1984.

Reprint: Estimation and Reconstruction for Zero-One Markov Processes.

DESCRIPTORS: (U) *Markov processes, Parameters, Estimates, Paths, Computations, Reprints

IDENTIFIERS: (U) PEB1102F, WUAFOSR2304A5

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

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AD-A146 862 CONTINUED

WISCONSIN UNIV-MILWAUKEE DEPT OF PHYSICS

Operators(Mathematics), Polynomials, Symmetry

(U) Lattice Statistics.

IDENTIFIERS: (U) *Lattice statistics, PES1102F,
WUAFOSR2304A5

DESCRIPTIVE NOTE: Final scientific rept. 1 Jul 83-30 Jun 84.

AUG 84

13P

PERSONAL AUTHORS: McQuistan,R. B. ;

CONTRACT NO. AFOSR-81-0182

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR

TR-84-0880

UNCLASSIFIED REPORT

ABSTRACT: (U) The objective of this research was to develop the mathematical formalism necessary to treat a number of unsolved problems in lattice statistics. Toward that end the investigators have considered the following problems: (1) The occupational degeneracy of particles of various shapes on lattice spaces of various dimensionalities and structures. (2) The nearest neighbor degeneracy for various kinds of particles on lattice spaces of various dimensionalities and structures. (3) The kth neighbor problem for simple particles on a one dimensional, rectangular lattice space. Utilizing set theoretic arguments they have been able to construct shift operator matrices that, in principle, permit them to establish recursion relations that describe exactly the occupational degeneracy for any shape particle on a lattice space of any dimensionality and structure. Similar techniques allow the investigators to determine the composite nearest neighbor degeneracy for simple particles, dumbbells and lambda-bell particles on quasi-two dimensional rectangular lattices. They have utilized the foregoing formalism to treat the thermodynamics (canonical and grand partition functions) for such systems. (Author)

DESCRIPTORS: (U) *Lattice dynamics, *Statistical analysis, Problem solving, Crystal lattices, Particles, Shape, Thermodynamics, Matrices(Mathematics).

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DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. EVI198

AD-A146 837

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AD-A146 810

12/1

MASSACHUSETTS UNIV AMHERST DEPT OF MATHEMATICS AND STATISTICS

NORTH CAROLINA UNIV AT CHAPEL HILL DEPT OF STATISTICS

(U) An Operator Method for Computing the Asymptotics of a Collision Resolution Interval.

(U) A Non-Commutative Quasi Subadditive Ergodic Theorem.

DESCRIPTIVE NOTE: Technical rept..

DESCRIPTIVE NOTE: Technical rept..

AUG 84 15P

AUG 84 20P

PERSONAL AUTHORS: Jajte, R. ;

PERSONAL AUTHORS: Rosenkrantz, W. A. ;

REPORT NO. TR-73

CONTRACT NO. AFOSR-82-0167

CONTRACT NO. F49620-82-C-0009

PROJECT NO. 2304

PROJECT NO. 2304

TASK NO. A5

TASK NO. A5

MONITOR: AFOSR

MONITOR: AFOSR

TR-84-0919

TR-84-0917

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) The investigators present an operator method for obtaining upper and lower bounds for the expected length of a collision resolution interval for various protocols. The method is elementary in that it circumvents the intricate and ingenious complex variable methods of Fayolle, Flajolet and Hofri (1983). It is also noted that the method can be applied to computing upper and lower bounds for the conditional delay. The problem of computing upper and lower bounds for the variances by this method remains open. (Author)

ABSTRACT: (U) This work is a contribution to the non-commutative pointwise ergodic theory which has been developed recently in a series of papers by a few authors. These authors extended to the von Neumann algebra context the classical Birkhoff's type theorems. This documents main goal is to prove a non-commutative version of a subadditive ergodic theorem.

DESCRIPTORS: (U) *Numerical methods and procedures, *Operators(Mathematics), *Computations, Asymptotic normality, Algorithms, Channels, Transmissivity, Equations, Variables, Collisions, Intervals, Resolution

DESCRIPTORS: (U) *Ergodic processes, *Theorems, Algebra, Hilbert space, Functions(Mathematics), Convergence, Operators(Mathematics), Banach space, Sequences(Mathematics), Orthogonality

IDENTIFIERS: (U) *Collision resolution intervals, Protocols, Upper bounds, Lower bounds, PE81102F, WUAFOSR2304A5

IDENTIFIERS: (U) Von Neuman Algebra, PE81102F, WUAFOSR2304A5

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A146 702 17/4 17/2 9/4
CALIFORNIA INST OF TECH PASADENA DEPT OF ELECTRICAL
ENGINEERING

AD-A146 370 12/1
CALIFORNIA UNIV SANTA BARBARA INST FOR THE
INTERDISCIPLINARY APPLICATIONS OF ALGEBRA AND
COMBINATORICS

(U) Coding for Spread-Spectrum Channels in the Presence of
Jamming.

(U) On Generalizations of the Perron-Frobenius Theorem.

DESCRIPTIVE NOTE: Interim rept. 1 Jul 83-30 Jun 84.

83 7P

83 7P

PERSONAL AUTHORS: Chang, L. F.; McEliece, R. J.;

PERSONAL AUTHORS: Goldberg, M.; Straus, E. G.;

CONTRACT NO. AFOSR-83-0298

CONTRACT NO. AFOSR-83-0150, AFOSR-79-0127

PROJECT NO. 2304

PROJECT NO. 2304

TASK NO. A8

TASK NO. A3

MONITOR: AFOSR

MONITOR: AFOSR
TR-84-0790

TR-84-0818

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) During this period research progressed in these areas: (1) a thorough analysis of the problems involved in communicating reliably in the presence of hostile jamming, and (2) the design of effective 'anti-jam' (A/J) countermeasures at the systems level. In the short-term, research is presently focused on the detailed mathematical analyses of several specific A/J modulation and coding strategies of the investigator's own design, which are applicable to modern spread-spectrum communication systems. (Author)

SUPPLEMENTARY NOTE: Pub. in Linear and Multilinear Algebra, v14 p143-156 1983.

Reprint: On Generalizations of the Perron-Frobenius Theorem.

DESCRIPTORS: (U) *Theorems, *Matrices (Mathematics), Eigenvalues, Eigenvectors, Reprints

IDENTIFIERS: (U) *Perron Frobenius theorem, PE61102F, WUAFOSR2304A3

DESCRIPTORS: (U) *Antijamming, *Spread spectrum, *Information theory, *Coding, *Communication equipment, Countermeasures, Mathematical analysis, Channels, Enemy, Strategy

IDENTIFIERS: (U) Viterbi's ratio, Game theory, Channel capacity, Erasures, Algebraic coding, PE61102F, WUAFOSR2304A6

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A146 309 12/1 5/3

FLORIDA UNIV GAINESVILLE

(U) Identifiability and Modeling in Econometrics.

83 41P

PERSONAL AUTHORS: Kalman, R. E. ;

CONTRACT NO. DAAG29-81-K-0136, DAAG29-77-G-0225

MONITOR: ARO, AFOSR
18343.7-MA, TR-84-0887

UNCLASSIFIED REPORT

Availability: Pub. in Developments in Statistics, v4 p87-136 (No copies furnished by DTIC/MTIS).

SUPPLEMENTARY NOTE: Supported in part by Grant AFOSR-78-3034.

Reprint: Identifiability and Modeling in Econometrics.

DESCRIPTORS: (U) *Mathematical models, *Econometrics, Parametric analysis, Stochastic processes, Estimates, Time series analysis, Equations, Reprints

AD-A146 278 17/8

CINCINNATI UNIV OH SOLID STATE ELECTRONICS LAB

(U) Integration of Detectors with Optical Waveguide Structures.

DESCRIPTIVE NOTE: Interim rept. 15 Mar 83-14 Mar 84,

MAY 84 31P

PERSONAL AUTHORS: Boyd, J. T. ;

CONTRACT NO. AFOSR-81-0130

PROJECT NO. 2305

TASK NO. 81

MONITOR: AFOSR
TR-84-0777

UNCLASSIFIED REPORT

ABSTRACT: (U) Progress in several areas regarding the integration of photodetectors with optical waveguide structures is presented. In the area of formation of photodetector arrays on layers of laser-recrystallized polycrystalline silicon, progress has occurred in using antireflection stripes to control the location of grain boundaries. Large areas free of grain boundaries are then available for photodetector fabrication. A 6mm x 5mm test chip containing photodetector arrays, switching MOS transistors, and a number of other test devices has been designed and masks fabricated. This test chip has been fabricated with operation just demonstrated. Detailed testing of this chip is now underway.

DESCRIPTORS: (U) *Photodetectors, *Optical waveguides, Antireflection coatings, Stripes, Control, Fabrication, Test equipment, Grain boundaries, Integration, Arrays, Chips(Electronics), Transistors

IDENTIFIERS: (U) PEG1102F, WJAFOSR2305B1

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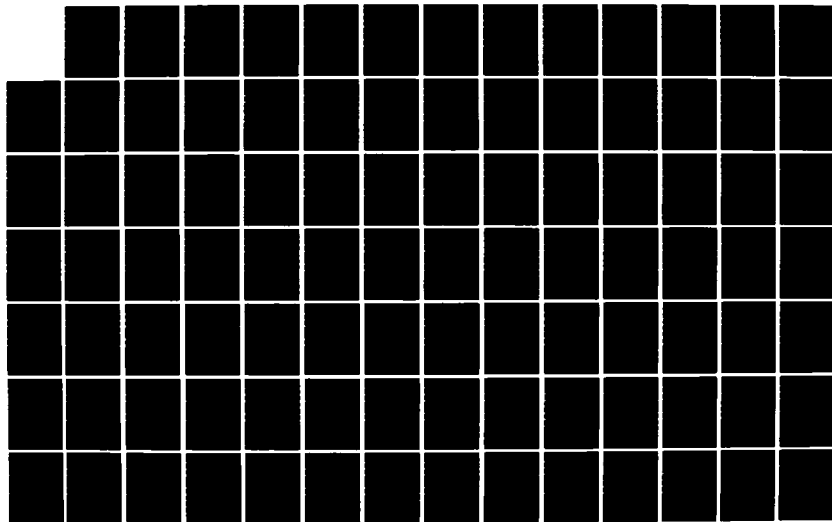
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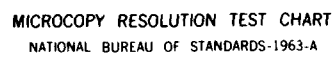
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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A146 277 7/3

AD-A146 286 12/1 20/4

GEORGIA UNIV ATHENS DEPT OF CHEMISTRY

SCIENCE APPLICATIONS INC PLEASANTON CALIF

(U) New Dialkylamino Derivatives of Trivalent Phosphorus.

(U) Moving Finite Elements in 2-D.

83 5P

DESCRIPTIVE NOTE: Final rept. 8 Jun 83-7 Jun 84.

PERSONAL AUTHORS: King, R. B. ; Sadanani, N. D. ; Sundaram, P. M. ;

AUG 84 173P

PERSONAL AUTHORS: Gellinas, R. J. ;

CONTRACT NO. AFOSR-81-0051

REPORT NO. SAI-84/1299

PROJECT NO. 2303

CONTRACT NO. F49620-81-C-0073

TASK NO. 82

PROJECT NO. 2304

MONITOR: AFOSR
TR-84-0676

TASK NO. A3

UNCLASSIFIED REPORT

MONITOR: AFOSR
TR-84-0832

SUPPLEMENTARY NOTE: Pub. in Phosphorus and Sulfur, v18
p125-128 1983.

UNCLASSIFIED REPORT

Reprint: New Dialkylamino Derivatives of Trivalent Phosphorus.

ABSTRACT: (U) The moving finite element (MFE) method is a new approach for numerically solving partial differential equation (PDE) systems; it is particularly well suited for resolving PDE solutions which may contain large, multiple gradients over highly disparate scales in both space and time. These types of PDE's abound in such basic technical disciplines as aerodynamics (with emphasis on shear layers, shocks and their possible interactions), combustion, plasma physics, material interface phenomena, continuum mechanics, and other transport processes.

DESCRIPTORS: (U) *Phosphorus, *Phosphorus compounds, *Phosphine, Alkyl radicals, Amines, Cyclic compounds, Synthesis (Chemistry), Molecular structure, Reprints

IDENTIFIERS: (U) Dialkylaminophosphines, Cyclootetraphosphines, Phosphine/Bis(Diisopropylamino), PE81102F, WUAFOSR230382

DESCRIPTORS: (U) *Finite element analysis, *Partial differential equations, *Boundary layer flow, Grids (Coordinates), Nodes, Linear systems, Problem solving, Moving targets, Two dimensional flow

IDENTIFIERS: (U) MFE (Moving Finite Element), WUAFOSR2304A3, PE81102F

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI19B

AD-A146 228 12/1

CALIFORNIA UNIV SANTA BARBARA INST FOR THE
INTERDISCIPLINARY APPLICATIONS OF ALGEBRA AND
COMBINATORICS

(U) Multiplicativity of 1 sub p Norms for Matrices. I,

83 12P

PERSONAL AUTHORS: Goldberg, M. ; Straus, E. G. ;

CONTRACT NO. AFOSR-83-0180

PROJECT NO. 2304

TASK NO. A3

MONITOR: AFOSR
TR-84-0791

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Linear Algebra and Its
Applications, v52/53 p351-360 1983. See also 2, AD-A145
794.

Reprint: Multiplicativity of 1 sub p Norms for Matrices.
I.

DESCRIPTORS: (U) *Matrices(Mathematics).
Operators(Mathematics), Inequalities, Reprints

IDENTIFIERS: (U) *Multiplicativity, WJAFOSR2304A3,
PE61102F

AD-A146 220 5/10

MEDICAL RESEARCH INST OF SAN FRANCISCO CA

(U) Visual Selective Attention.

DESCRIPTIVE NOTE: Annual scientific rept..

MAR 84 4P

PERSONAL AUTHORS: Nakayama, K. ;

CONTRACT NO. AFOSR-83-0320

PROJECT NO. 2313

TASK NO. A5

MONITOR: AFOSR
TR-84-0774

UNCLASSIFIED REPORT

ABSTRACT: (U) This technique has been used to
differentially localize neural activity associated with
sinusoidal grating onset and offset in different evidence
that the field potentials recorded on the surface of the
occipital lobe originate in an area other than the
primary visual cortex. Because current source density
analysis has such great ability to localize the origins
of visual evoked potentials, this technique can also be
applied to examine the origin of attention-related
potentials. It is expected that the results of this study
will aid in the interpretation of event-related
potentials in humans.

DESCRIPTORS: (U) *Visual cortex, *Vision,
Electrophysiology, Test methods, Electrodes, Selection

IDENTIFIERS: (U) Visual evoked potentials, WJAFOSR2313A5,
PE61102F

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A146 218 12/1

CALIFORNIA UNIV LOS ANGELES DEPT OF SYSTEM SCIENCE

(U) Canonical Decompositions of Completely Nonunitary Contractions,

JUL 84 15P

PERSONAL AUTHORS: Levan, N. ;

CONTRACT NO. AFOSR-79-0083

PROJECT NO. 2304

TASK NO. A8

MONITOR: AFOSR
TR-84-0783

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Mathematical Analysis and Applications, v101 n2 p814-826 Jul 84.

Reprint: Canonical Decompositions of Completely Nonunitary Contractions.

DESCRIPTORS: (U) *Hilbert space, *Operators(Mathematics), Decomposition, Contraction, Reprints

IDENTIFIERS: (U) Isometrics, WUAFOSR2304A8, PE61102F

AD-A146 191 12/1

MARYLAND UNIV COLLEGE PARK DEPT OF MATHEMATICS

(U) On the Sinusoidal Limit of Stationary Time Series.

84 11P

PERSONAL AUTHORS: Kedem, B. ;

CONTRACT NO. AFOSR-82-0187

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR
TR-84-0788

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in the Annals of Statistics, v12 n2 p665-674 1984.

Reprint: On the Sinusoidal Limit of Stationary Time Series.

DESCRIPTORS: (U) *Time series analysis, Stationary, Theorems, Equations, Reprints

IDENTIFIERS: (U) Sinusoidal limit theorem, Slutsky theorem, PE61102F, WUAFOSR2304A5

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A146 139

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13/2

AD-A146 139 CONTINUED

DREXEL UNIV PHILADELPHIA PA DEPT OF CIVIL ENGINEERING

(U) Materials for Emergency Repair of Runways.

DESCRIPTIVE NOTE: Interim rept. 1 Oct 83-31 Mar 84.

APR 84 148P

PERSONAL AUTHORS: Popovics, S. ;

REPORT NO. 001129-1

CONTRACT NO. AFOSR-83-0248

PROJECT NO. 2307

TASK NO. C2

MONITOR: AFOSR
TR-84-0893

UNCLASSIFIED REPORT

ABSTRACT: (U) The purpose of the investigation here was to test four inorganic cementing materials, and screen out from further investigation those that are obviously unsuitable for the fulfillment of the requirements for emergency repair of concrete runways under war conditions. The four materials are SET-45 cold formula; SET-45 hot formula; Aluminum phosphate (AIP cement; and Jet cement. In addition, a 50/50 blend of the SET-45 cold and hot formulas was investigated, and a portland cement of Type III was tested for the sake of comparison. The SET-45 formulas and the AIP cement are based on magnesium oxide. The Jet cement is a modified portland cement. A combination of mechanical testing and physicochemical examinations was used. The mechanical testing concentrated on the early strength developing capabilities of the cements under room temperature. On this basis the cements of magnesium oxide content, that is the SET-45 formulas appear to be the most suitable for the project. For instance, the SET-45 cold formula can produce compressive strengths in excess of 10,000 psi at the age of 1 hour with low water contents. Even with high water content, enough to produce flowing consistency, the 1-hr strengths are regularly over 3,000 psi. The corresponding setting time of this formula, however, is usually less than 10 minutes even at room temperature. The setting time of SET-45 hot formula is much longer.

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however its one-hour strength is also reduced. The blend of the two formulas displays in-between strengths and times of setting.

DESCRIPTORS: (U) Cements, Emergencies, Runways, Bomb damage, Repair, Magnesium oxides, Ammonium compounds, Phosphates, Aluminum compounds, Mixtures, Mechanical properties, Physicochemical properties, Laboratory tests

IDENTIFIERS: (U) SET-45 cements, Portland cement, Fly ash, PE61102F, WJAFOSR2307C2

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A146 025 CONTINUED

AD-A146 025 5/7 9/2

SRI INTERNATIONAL MEMLO PARK CA ARTIFICIAL INTELLIGENCE CENTER

meaning of such representations using the tools of formal logic. (Author)

(U) Knowledge Representation and Natural-Language Semantics.

DESCRIPTORS: (U) *Artificial intelligence, *Natural language, *Semantics, Computer logic, Information retrieval, Models, Data bases, Air Force research

DESCRIPTIVE NOTE: Annual technical rept. no. 2, 1 Jun 83-30 May 84.

IDENTIFIERS: (U) Knowledge representation. LPN-SRI-4488

JUL 84 10P

PERSONAL AUTHORS: Moore, R. C. ;

CONTRACT NO. F49620-82-K-0031

MONITOR: AFOSR
TR-84-0799

UNCLASSIFIED REPORT

ABSTRACT: (U) Central to almost all aspects and applications of artificial intelligence is the representation and manipulation of large bodies of knowledge about the world. When viewed from the perspective of their ability to express facts about the external world, however, most knowledge representation schemes currently used in artificial intelligence are constrained by the limits of first-order logic. That is, they provide terms for referring to individuals, predicates for expressing properties and relations of individuals, and mechanisms that achieve some of the effects of propositional connectives and quantifiers. Much research effort has been expended on ways of organizing knowledge bases and developing information retrieval mechanisms; in terms of pure expressive power, however, existing representation systems are rather limited. This issue is brought into sharp focus when one seriously attempts to analyze the semantic content of expressions in natural language, since many types of linguistic expressions seem to require something beyond first-order logic to represent their meaning perspicuously. This project undertakes a program basic research in knowledge representation, focusing on the representation of concepts needed for the semantic analysis of natural language. The objectives of the project are to produce formalisms, suitable for manipulation by computer, for the representation of specific concepts that are important for natural-language semantics, and to give an independent account of the

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AD-A148 004 6/19

AD-A148 003 12/1 9/3

CALIFORNIA UNIV DAVIS HUMAN PERFORMANCE LAB

CALIFORNIA UNIV DAVIS HUMAN PERFORMANCE LAB

(U) Combined Effects of Breathing Resistance and Hyperoxia
on Aerobic Work Tolerance.

(U) Stability Margins of Diagonally Perturbed
Multivariable Feedback Systems.

77 8P

NOV 82 7P

PERSONAL AUTHORS: Dressendorfer, R. H. ; Wade, C. E. ;
Bernauer, E. M. ;

PERSONAL AUTHORS: Safonov, M. G. ;

CONTRACT NO. AFOSR-78-3510

CONTRACT NO. AFOSR-80-0013

PROJECT NO. 2312

PROJECT NO. 2304

TASK NO. A1

TASK NO. A1

MONITOR: AFOSR
TR-84-0784

MONITOR: AFOSR
TR-84-0835

UNCLASSIFIED REPORT

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SUPPLEMENTARY NOTE: Pub. in Jnl. of Applied Physiology:
Respiratory, Environmental and Exercise Physiology, v42
n3 p444-448 1977.

SUPPLEMENTARY NOTE: Pub. in IEEE Proceedings, v129 ptD n6
p251-256 Nov 82.

Reprint: Combined Effects of Breathing Resistance and
Hyperoxia on Aerobic Work Tolerance.

Reprint: Stability Margins of Diagonally Perturbed
Multivariable Feedback Systems.

DESCRIPTORS: (U) *Respiration, *Exercise(Physiology),
*Hyperoxia, Resistance(Biology), Males, Oxygen
consumption, Rates, Work, Reprints

DESCRIPTORS: (U) *Control systems, *Feedback, *Transfer
functions, Stability, Multivariate analysis,
Perturbations, Matrices(Mathematics), Reprints

IDENTIFIERS: (U) WUAFOSR2312A1, PES1102F

IDENTIFIERS: (U) WUAFOSR2304A1, PES1102F

AD-A148 004

AD-A148 003

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A145 944 20/8

AD-A145 944 CONTINUED

MINNESOTA UNIV MINNEAPOLIS DEPT OF COMPUTER SCIENCE

(U) Analysis of Accretion and Deletion at Boundaries in Dynamic Scenes.

DESCRIPTORS: (U) *Optical images, Boundaries, Flow, Sides, Matching, Surfaces, Edges, Motion

IDENTIFIERS: (U) Edge detection, WUAFOSR2304A7, PE81102F

DESCRIPTIVE NOTE: Technical rept..

MAY 84 13P

PERSONAL AUTHORS: Mutch,K. M. ;Thompson,W. B. ;

REPORT NO. TR-84-7

CONTRACT NO. F49620-83-C-0140

PROJECT NO. 2304

TASK NO. A7

MONITOR: AFOSR
TR-84-0788

UNCLASSIFIED REPORT

ABSTRACT: (U) Locating object boundaries in images is an important but difficult problem. Intensity-based edge detection provides ambiguous or misleading boundary information in many situations, such as textured regions. Motion-based techniques can provide more reliable results in these cases. At object boundaries where occlusion occurs, surface regions will typically appear or disappear over time when motion is present. These regions of changing visibility may be used to indicate both object boundaries and the side of the boundary corresponding to the occluded surface. Thus, in dynamic scenes, regions of surface accretion or deletion can be found using matching technique similar to those used to determine optical flow in an image sequence. Regions in one frame that are not adequately matched by any region in previous frames correspond to accretion. Regions that have no matches in subsequent frames correspond to deletion. In either case, an occlusion boundary is present. Furthermore, by associating accretion or deletion regions with a surface on one side of a boundary, it is possible to determine which side of the boundary is being occluded. This association can be based purely on visual motion - the accretion or deletion region moves with the same image velocity as the remaining visible surface to which it is attached.

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AD-A145 940 11/8 10/1

AD-A145 940 CONTINUED

ARIZONA STATE UNIV TEMPE DEPT OF MECHANICAL AND
AEROSPACE ENGINEERING

IDENTIFIERS: (U) WUAFOSR2308A2. PEB1102F

(U) Material Problems for High-Temperature, High-Power
Space Energy-Conversion Systems.

DESCRIPTIVE NOTE: Progress rept. no. 1 (Annual).

MAY 84 124P

PERSONAL AUTHORS: Ramalingam, M. L. ; Jacobson, D. L. ;
Morris, J. F. ; Snir, S. ;

REPORT NO. CR-R-84032

CONTRACT NO. AFOSR-83-0067

PROJECT NO. 2306

TASK NO. A2

MONITOR: AFOSR
TR-84-0800

UNCLASSIFIED REPORT

ABSTRACT: (U) High-temperature, high-power space energy-conversion systems follow an evolutionary path through continually expanding materials frontiers. Exponential growth trends point to requirements for ultimate alloys comprising the most refractory metals and metalloid additives. Therefore understanding properties, transport tendencies and interaction characteristics of these ultralloy components is a crucial essentiality. Studies of such thermophysicochemical phenomena and their detailed parametric dependencies and influences for refractory materials receive intensive and extensive support in the USSR and other iron-curtain countries. But all potential users also recognize the generic ductility, embrittlement enigmas of the highest-temperature alloys--and the related implications of recrystallization. This latter category is the research area of concentration for these studies.

DESCRIPTORS: (U) *Space systems, *Energy conversion, *High power, *Materials, Alloys, Embrittlement, Additives, Interactions, Recrystallization, Refractory metals, Ductility, Tungsten

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

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AD-A145 910 12/1

CALIFORNIA UNIV DAVIS

UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES DEPT OF ELECTRICAL ENGINEERING

(U) Stretch-Induced Growth in Chicken Wing Muscles. A New Model of Stretch Hypertrophy.

(U) The Linear-Quadratic Optimal Control Problem--The Operator Theoretic Viewpoint.

80 11P

84 28P

PERSONAL AUTHORS: Holly, R. G.; Barnett, J. G.; Ashmore, C. R.; Taylor, R. G.; Mole, P. A.;

PERSONAL AUTHORS: Jonckheere, E. A.; Silverman, L. M.;

CONTRACT NO. AFOSR-78-3510

CONTRACT NO. AFOSR-80-0013

PROJECT NO. 2312

PROJECT NO. 2304

TASK NO. A1

TASK NO. A1

MONITOR: AFOSR TR-84-0782

MONITOR: AFOSR TR-84-0836

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in American Jnl. of Physiology, v238 n7 pC82-C71 1980.

SUPPLEMENTARY NOTE: Pub. in Operator Theory: Advances and Applications, v12 p277-302 1984.

Reprint: Stretch-Induced Growth in Chicken Wing Muscles. A New Model of Stretch Hypertrophy.

Reprint: The Linear-Quadratic Optimal Control Problem--The Operator Theoretic Viewpoint.

DESCRIPTORS: (U) *Muscles, *Growth(Physiology), *Muscle fibers, Stretch forming, Chickens, Enzymes, Electromyography, Reprints

DESCRIPTORS: (U) *Control theory, *Control systems, *Linear systems, Optimization, Hilbert space, Riccati equation, Operators(Mathematics), Reprints

IDENTIFIERS: (U) PEB1102F, WUAFOSR2312A1

IDENTIFIERS: (U) Wiener Hopf operators, Linear quadratic optimal control, PEB1102F, WUAFOSR2304A1

AD-A145 931

AD-A145 910

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI19B

AD-A145 908 20/8

AD-A145 904 12/1

TEXAS UNIV AT AUSTIN COLL OF ENGINEERING

NORTH CAROLINA UNIV AT CHAPEL HILL DEPT OF STATISTICS

(U) Automatic Recognition and Turbulent Objects.

(U) Extrapolation and Moving Average Representation for Stationary Random Fields and Beurling's Theorem.

DESCRIPTIVE NOTE: Annual rept. 1 Dec 82-31 Dec 83.

84 14P

DEC 83 18P

PERSONAL AUTHORS: Aggarwal, J. K. ;

PERSONAL AUTHORS: Soltani, A. R. ;

CONTRACT NO. F49620-83-K-0013

CONTRACT NO. F49620-82-C-0009

PROJECT NO. 2305

PROJECT NO. 2304

TASK NO. 83

TASK NO. A5

MONITOR: AFOSR
TR-84-0771

MONITOR: AFOSR
TR-84-0801

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) The report describes briefly the following three projects: (1) A Normalized Quadtree Representation and A Volume/Surface Octree Representation; (2) Analysis of a Model for Parallel Image Processing; and (3) Determination Motion Parameters Using Intensity and Range Information.

SUPPLEMENTARY NOTE: Pub. in Annals of Probability, v12 n1 p120-132 1984.

Reprint: Extrapolation and Moving Average Representation for Stationary Random Fields and Beurling's Theorem.

DESCRIPTORS: (U) *Optical data, *Image processing, *Optical images, Motion, Algorithms, Pattern recognition, Parallel processing, Automatic, Parameters

DESCRIPTORS: (U) *Random variables, *Extrapolation, Stationary, Hilbert space, Functions(Mathematics), Reprints

IDENTIFIERS: (U) Quadrees, PE81102F, WUAFOSR230583

IDENTIFIERS: (U) *Moving average representation, Beurlings theorem, Polydiscs, PE81102F, WUAFOSR2304A5

AD-A145 908

AD-A145 904

UNCLASSIFIED

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A145 896

7/4

TRW SPACE AND TECHNOLOGY GROUP REDONDO BEACH CA

(U) Study of Singlet Oxygen-Pentavalent Phosphorus Reactions.

DESCRIPTIVE NOTE: Final rept. Apr 82-May 84,

MAY 84

37P

PERSONAL AUTHORS: Marabella, L. J. ; Kuper, J. ; Lovejoy, C. ; Betts, J. ;

CONTRACT NO. F49620-82-C-0045

PROJECT NO. 2303

TASK NO. 81

MONITOR: AFOSR
TR-84-0499

UNCLASSIFIED REPORT

ABSTRACT: (U) Detailed studies of an atomic oxygen-singlet oxygen-dimethyl hydrogen phosphite (DMHP) gas phase reaction system have been performed. Decay of singlet delta oxygen was modeled and a reaction mechanism which explains the experimental observations was derived. Semilog plots of O₂ singlet delta emission intensities in the presence of O-atoms and DMHP versus time obtained show an initial rise in the emission followed by a straight line decay.

DESCRIPTORS: (U) *Phosphorus, *Oxygen, *Chemical reactions, Gases, Kinetics, Phosphites, Decay, Phosphonates, Esters

IDENTIFIERS: (U) Singlets, PE61102F, WJAFOSR2303B1

AD-A145 878

20/5

ROCHESTER UNIV NY DEPT OF CHEMISTRY

(U) Laser-Induced Neutralization and Negative-Ion Formation in Surface Scattering.

84

5P

PERSONAL AUTHORS: Lam, K. S. ; Liu, K. C. ; George, T. F. ;

CONTRACT NO. AFOSR-82-0048

PROJECT NO. 2303

TASK NO. A2

MONITOR: AFOSR
TR-84-0788

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in SPIE, v459 p18-21 1984.

Reprint: Laser-Induced Neutralization and Negative-Ion Formation in Surface Scattering.

DESCRIPTORS: (U) *Laser applications, *Ionization, *Scattering, Surfaces, Neutralization, Anions, Metals, Resonance, Electron transfer, Conduction bands

IDENTIFIERS: (U) PE61102F, WJAFOSR2303A2

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AD-A145 878

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A145 872 9/2 13/8

AD-A145 864 20/2

SRI INTERNATIONAL MENLO PARK CA

FLORIDA UNIV GAINESVILLE DEPT OF ELECTRICAL ENGINEERING

(U) Test-Bed for Programmable Automation Research. Phase I.

(U) Studies of Grown-In Defects Versus Growth Parameters in III-V Compound Semiconductors.

DESCRIPTIVE NOTE: Final rept., 1 Sep 82-31 Mar 84,

DESCRIPTIVE NOTE: Annual technical rept. 11 Jun 83-10 Jun 84.

APR 84 94P

PERSONAL AUTHORS: Smith, R. C. ; Bollies, R. C. ; Herson, J. H. ; Myers, J. K. ; Nitzan, D. ;

JUN 84 139P

PERSONAL AUTHORS: L. I. S. S. ;

CONTRACT NO. F49620-82-K-0034

CONTRACT NO. AFOSR-81-0187

PROJECT NO. 2305

PROJECT NO. 2308

TASK NO. K1

TASK NO. 81

MONITOR: AFOSR
TR-84-0778MONITOR: AFOSR
TR-84-0779

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) The goals of this project were to: Explore and develop programmable automation techniques for robot manipulation, sensing, and industrial vision; and Extend our programmable assembly station as a test-bed for generating and demonstrating those techniques. Five research tasks were concerned with two general problems: determining the location of parts, and moving a manipulator safely, without collisions. A sixth task was the extension of SRI's programmable assembly station. The tasks were: Analysis of Locational Uncertainty; Acquisition and Analysis of Range Data; Characterization of Feature Detectors; Multisensor Collision Avoidance; Coordination of Multiple Manipulators; and Extension of a Programmable Assembly Station.

DESCRIPTORS: (U) *Computer applications, *Automation, *Computer programming, *Test beds, Detectors, Data acquisition, Collision avoidance, Robots, Manipulators, Triangulation, Transformations, Air Force research

IDENTIFIERS: (U) LPN-SRI-4703, PE81102F, WUAFOSR2308K1

ABSTRACT: (U) The objectives of this research are to conduct: (1) A detailed analysis of the grown-in defects and radiation induced defects in GaAs and other III-V materials grown by the LEC, VPE, LPE, and MOCVD techniques under different growth and annealing conditions, (2) Theoretical modelling of the native defects for identifying the physical origins of the deep-level traps in GaAs and other III-V materials, (3) Theoretical and experimental study of the potential well of electron traps from analyzing the electric field enhanced emission rates deduced from the nonexponential DLTS data, and (4) Study of one-Mev electron irradiation induced deep-level defects in GaAs, AlGaAs, and InP materials. The main research accomplishments are summarized.

DESCRIPTORS: (U) *Semiconductors, *Defects (Materials), Group III compounds, Group V compounds, Radiation effects, Gallium arsenides, Crystal growth

IDENTIFIERS: (U) PE81102F, WUAFOSR2308B1

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A145 861

12/1

AD-A145 861 CONTINUED

UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES DEPT OF
ELECTRICAL ENGINEERING

(U) Return Difference Feedback Design for Robust
Uncertainty Tolerance in Stochastic Multivariable
Control Systems.

DESCRIPTIVE NOTE: Final rept. 1 Oct 82-29 Sep 84.

JUL 84 22P

PERSONAL AUTHORS: Safonov, M. G. ;

CONTRACT NO. AFOSR-80-0013

PROJECT NO. 2304

TASK NO. A1

MONITOR: AFOSR
TR-84-0802

UNCLASSIFIED REPORT

ABSTRACT: (U) The objective of the research has been to develop engineering methodologies applicable, but not limited, to aerospace automatic control design problems in which there are performance specifications requiring precise control of system behavior in the presence of stochastic disturbances (e.g., wind gusts) and large-but-bounded uncertainties in the dynamical response of the system (e.g., parameter uncertainty, unmodeled nonlinearities, and so forth). During the past three years of research, a cohesive body of theory has been developed that enables engineers to relate the ability of feedback control systems to meet such specifications directly and quantitatively to the 'return difference matrix' associated with the system's feedback loops. New results enabling the infinity optimization' of returned difference singular value Bode plots promise to be of great value in robust multivariable feedback controller synthesis. Continuing research is currently being aimed at further tightening the links between this theory and the most recent developments of modern stochastic linear optimal control synthesis theory, and extending the results to admit more practical problems so that this theory may be used more effectively by engineers to efficiently and systematically design the feedback gains that determine a feedback system's return difference

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matrix. Such results substantially reduce the dependence of control engineers on intuition, simulation, and luck and provide the know-how to successfully and efficiently solve the increasingly complex and demanding aerospace control problems of the coming decades. (Author)

DESCRIPTORS: (U) *Multivariate analysis, *Control systems, *Stochastic processes, Finite difference theory, Aerospace systems, Dynamic response, Matrices(Mathematics), Methodology, Cohesion, Engineers, Simulation, Bodies, Behavior, Synthesis, Precision, Feedback, Theory, Control, Gusts, Loops, Value, Wind

IDENTIFIERS: (U) Multivariate controls, Stochastic controls, PEB1102F, WJAFOSR2304A1

UNCLASSIFIED

OTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A145 852 12/1

WASHINGTON UNIV SEATTLE

(U) Resonant Modal Interactions and Adiabatic Invariance for a Nonlinear Wave Equation in a Variable Domain.

84 05P

PERSONAL AUTHORS: Kevorkian, J. ; Li, H. K. ;

CONTRACT NO. AFOSR-80-0175

PROJECT NO. 2304

TASK NO. A4

MONITOR: AFOSR
TR-84-0824

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Studies in Applied Mathematics, p1-84 1984.

Reprint: Resonant Modal Interactions and Adiabatic Invariance for a Nonlinear Wave Equation in a Variable Domain.

DESCRIPTORS: (U) *Wave equations, *Nonlinear algebraic equations, *Invariance, *Adiabatic conditions, *Transformations(Mathematics), *Perturbations, Interactions, Resonance, Computations, Reprints

IDENTIFIERS: (U) PES1102F, WUAFOSR2304A4

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AD-A145 851

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AD-A145 851 12/1 9/3

UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES DEPT OF ELECTRICAL ENGINEERING

(U) Stability of Interconnected Systems Having Slope-Bounded Nonlinearities.

JUN 84 14P

PERSONAL AUTHORS: Safonov, M. G. ;

CONTRACT NO. AFOSR-80-0013

PROJECT NO. 2304

TASK NO. A1

MONITOR: AFOSR
TR-84-0808

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Proceedings of Conference on Analysis and Optimization of Systems, 19-22 Jun 84.

Reprint: Stability of Interconnected Systems Having Slope-Bounded Nonlinearities.

DESCRIPTORS: (U) *Nonlinear systems, *Stability, Matrices(Mathematics), Multiplication, Transfer functions, Reprints

IDENTIFIERS: (U) PES1102F, WUAFOSR2304A1

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DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. EVI198

AD-A145 828

12/1

AD-A145 821

20/1

20/14

RENSSELAER POLYTECHNIC INST TROY NY DEPT OF MATHEMATICAL SCIENCES

DELAWARE UNIV NEWARK DEPT OF MATHEMATICAL SCIENCES

(U) Non-Linear Systems in Infinite Dimensional State Spaces.

(U) The Development of New Methods for Solving the Target Identification or Inverse Scattering Problem for Time-Harmonic Acoustic and Electromagnetic Waves.

DESCRIPTIVE NOTE: Interim technical progress rept. 18 Jun 83-14 Jun 84.

DESCRIPTIVE NOTE: Final rept. 1 May 81-31 Aug 84,

AUG 84

JUL 84

4P

5P

PERSONAL AUTHORS: Slemrod, M. ;

PERSONAL AUTHORS: Colton, D. L. ;

CONTRACT NO. AFOSR-81-0172

CONTRACT NO. AFOSR-81-0103

PROJECT NO. 2304

PROJECT NO. 2304

TASK NO. A1

TASK NO. A4

MONITOR: AFOSR

MONITOR: AFOSR

TR-84-0818

TR-84-0798

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) The research in this effort has been directed into two main research areas -- nonlinear distributed parameter control systems, and nonlinear continuum dynamics with an emphasis on phase transitions. In the first year, the investigator has formulated a theory of feedback stabilization of a one dimensional string using non-local 'pseudo-punctual' magnetic controls. In the second area, work has centered on materials exhibiting first order phase transitions. This should provide a unified theory of dynamic phase transitions and their numerical computation. Ten papers were prepared for presentation or publication during this period. (Author)

DESCRIPTORS: (U) *Control theory, Feedback, Continuum mechanics, Dynamics, Nonlinear systems, Phase transformations

IDENTIFIERS: (U) Phase transitions, State spaces, PE81102F, WUAFOSR2304A1

ABSTRACT: (U) During this period, the single investigator investigated two topics. On the inverse scattering problem he wrote 1 book, 8 research papers and 7 survey papers. On the inverse Stefan problem he wrote 3 research papers and 1 survey paper. The papers on inverse scattering derive and numerically implement new, stable methods for solution, obtain a variety of uniqueness theorems and investigate the class of far field patterns associated with the scattering of plane waves by a bounded obstacle. (The set of far field patterns is in general not dense in the space of square integrable functions defined on the unit sphere when the wave number is an eigenvalue of the interior problem. This suggests new methods of solution currently being investigated.) The papers on the inverse Stefan problem derive and numerically implement new methods for solution in two space variables, prove in a new way the strong maximum principle for the heat equation and obtain expansion theorems for analytic solutions for the heat equation.

DESCRIPTORS: (U) *Scattering, Acoustic waves, Electromagnetic wave propagation, Patterns, Far field

IDENTIFIERS: (U) *Inverse scattering problem, Inverse Stefan problem, PE81102F, WUAFOSR2304A4

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AD-A145 821

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OTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A145 814 12/1 9/5

AD-A145 813 7/4

UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES DEPT OF ELECTRICAL ENGINEERING

ROCKWELL INTERNATIONAL ANAHEIM CA SCIENCE CENTER

(U) Propagation of Conic Model Uncertainty in Hierarchical Systems.

(U) Electrochemistry of Rare-Earth Diphthalocyanines.

DESCRIPTIVE NOTE: Final rept. 1 May 83-30 Apr 84.

JUN 83 10P

JUL 84 25P

PERSONAL AUTHORS: Safonov, M. G. ;

PERSONAL AUTHORS: Nicholson, M. M. ; Weismuller, T. P. ;

CONTRACT NO. AFOSR-80-0013, NSF-ECS81-12327

REPORT NO. SCS383.1FR

PROJECT NO. 2304

CONTRACT NO. F49620-83-C-0088

TASK NO. A1

PROJECT NO. 2303

MONITOR: AFOSR
TR-84-0807MONITOR: AFOSR
TR-84-0769

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in IEEE Transactions on Circuits & Systems, VCS-30 no p388-398 Jun 83.

Reprint: Propagation of Conic Model Uncertainty in Hierarchical Systems.

UNCLASSIFIED REPORT

ABSTRACT: (U) Lutetium diphthalocyanine films on tin oxide electrodes in several aqueous chloride electrolytes were investigated by cyclic voltammetry and in situ visible-range absorption spectroscopy at controlled potentials. Although several redox processes of the dye film were evident in the voltammograms, they were more clearly resolved in the spectroelectrochemical data, from which equilibrium potentials corresponding to fifty percent conversion between successive oxidation states were determined.

DESCRIPTORS: (U) *Probability, Conical bodies, Mathematical models, Hierarchies, Stability, Circuit interconnections, Reprints

IDENTIFIERS: (U) *Large interconnected systems, PE81102F, WJAFOSR2304A1

DESCRIPTORS: (U) *Electrochemistry, *Phthalocyanines, *Rare earth compounds, Lutetium compounds, Electrodes, Electrolytes, Dyes, Films, Tin compounds, Oxides, Voltammetry, Oxidation reduction reactions

IDENTIFIERS: (U) *Diphthalocyanines, PE81102F, WJAFOSR2303B2

AD-A145 814

AD-A145 813

UNCLASSIFIED

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A145 811 20/11

AD-A145 811 CONTINUED

NORTH CAROLINA UNIV AT CHARLOTTE DEPT OF MATHEMATICS

dependence, Structural response

(U) Optimum Replacement of a System Subject to Shocks.

IDENTIFIERS: (U) PE81102F, WUAFOSR2304A5

DESCRIPTIVE NOTE: Technical rept..

AUG 84 12P

PERSONAL AUTHORS: Abdel-Hameed, M. ;

CONTRACT NO. AFOSR-80-0248

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR
TR-84-0817

UNCLASSIFIED REPORT

ABSTRACT: (U) A system is subject to shocks which cause the system to deteriorate. In previous studies, distribution properties of such systems are discussed for different types of deterioration processes. At best these processes are right continuous Markov processes. Our interest in this paper is to tackle a related but different problem: we assume that the normal cost of running the system is 'a' per unit of time and that each shock to the system increases the running cost by 'c' per unit of time. The cost of completely replacing the system is c sub 0. The system is to be completely replaced at times $T, 2T, \dots$. Such replacement policies are known as periodic replacement policies. Since each shock weakens the system and makes it more expensive to run, it is desirable to determine a replacement time for the system. Boland and Proschan (4) consider periodic replacement of the system and give sufficient conditions for the existence of an optimal finite period, assuming that the shock process is a non-homogeneous Poisson process and the cost structure is time dependent, still requiring that the shock process is a nonhomogeneous Poisson process. We show, via a sample path argument, that the results of (3) and (4) hold for any counting process whose jump size of one unit magnitude.

DESCRIPTORS: (U) *Shock waves, *Shock (Mechanics), Costs, Optimization, Replacement, Continuous processing, Deterioration, Poisson equation, Markov processes, Time

AD-A145 811

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DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. EV119B

AD-A145 808 20/12 9/5

AD-A145 805 12/1 20/6

CALIFORNIA UNIV SAN DIEGO LA JOLLA DEPT OF ELECTRICAL
ENGINEERING AND COMPUTER SCIENCES

MINNESOTA UNIV MINNEAPOLIS DEPT OF COMPUTER SCIENCE

(U) Research on Materials and Components for Opto-
Electronic Signal Processing.

(U) Dynamic Occlusion Analysis in Optical Flow Fields.

DESCRIPTIVE NOTE: Technical rept.,

DESCRIPTIVE NOTE: Annual rept. 1 Oct 82-30 Sep 83,

MAY 84

23P

JAN 84

33P

PERSONAL AUTHORS: Chang, W. S. C. ; Delavaux, J. M. ;
Foreuhar, S. ; Van Eck, T. ; Walpita, L. M. ;PERSONAL AUTHORS: Thompson, W. B. ; Mutch, K. M. ; Berzins, V.
A. ;

CONTRACT NO. AFOSR-80-0037

CONTRACT NO. F49620-83-C-0140, NSF-MCS81-05215

PROJECT NO. 2305

PROJECT NO. 2304

TASK NO. B1

TASK NO. A7

MONITOR: AFOSR

MONITOR: AFOSR
TR-84-0823

UNCLASSIFIED REPORT

ABSTRACT: (U) A number of papers representing the accumulated research results on the chirped grating lenses have been prepared and submitted for publication. They are summarized in this report. A new direction of research to investigate the use of III-V compound semiconductors has shown that very large electro-optical effects may be expected in this wavelength range. (Author)

DESCRIPTORS: (U) *Semiconductors, *Waveguides, *Electrooptics, *Signal processing, Lenses, Lithium niobates, Group III compounds, Group IV compounds, Group V compounds, Gratings(Spectra), Optical waveguides, Fresnel lenses

IDENTIFIERS: (U) Chirped grating lenses, Waveguide lenses, Optoelectronic signal processing, Planar waveguides, Optical signals, WUAFOSR2305B1, PB81102F

AD-A145 808

UNCLASSIFIED

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UNCLASSIFIED REPORT

ABSTRACT: (U) Optical flow can be used to locate dynamic occlusion boundaries in an image sequence. Derived an edge detection algorithm sensitive to changes in flow fields likely to be associated with occlusions. The algorithm is patterned after the Marr-Hildreth zero-crossing detectors currently used to locate boundaries in scalar fields. Zero-crossing detectors are extended to identify changes in direction and/or magnitude in a vector-valued flow field. As a result, the detector works for flow boundaries generated due to the relative motion of two overlapping surfaces, as well as the simpler case of motion parallax due to a sensor moving through an otherwise stationary environment. It is then shown the approach can be extended to identify which side of a dynamic occlusion boundary corresponds to the occluding surface. The fundamental principal involved is that at an occlusion boundary, the image of the surface boundary moves with the image of the occluding surface. Such information is important in interpreting dynamic scenes. Results are demonstrated on optical flow fields automatically computed from real image sequences. (Author)

DESCRIPTORS: (U) *Algorithms, *Flow fields, *Optical processing, *Computations, Edges, Detection, Motion, Optical properties, Dynamics, Images, Sequences.

AD-A145 805

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A145 805 CONTINUED

Boundaries, Surfaces

IDENTIFIERS: (U) Edge detection algorithm, *Optical flow,
Dynamic occlusion, WJAFOSR2304A7, PE61102F

AD-A145 794 12/1

CALIFORNIA UNIV SANTA BARBARA INST FOR THE
INTERDISCIPLINARY APPLICATIONS OF ALGEBRA AND
COMBINATORICS

(U) Multiplicativity of L sub p Norms for Matrices. II.

84 11P

PERSONAL AUTHORS: Goldberg, M. ;

CONTRACT NO. AFOSR-83-0150

PROJECT NO. 2304

TASK NO. A3

MONITOR: AFOSR
TR-84-0792

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Linear Algebra and Its
Applications, p1-10 1984.

Reprint: Multiplicativity of 1 sub p Norms for Matrices.
II.

DESCRIPTORS: (U) *Matrices(Mathematics), *Multiplication
factor, Inequalities, Theorems, Reprints

IDENTIFIERS: (U) *Multiplicativity, *Norms,
WJAFOSR2304A3, PE61102F

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DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. EVI198

AD-A145 782 13/8 20/5

AD-A145 790 8/19

BATTELLE COLUMBUS LABS OH

CALIFORNIA UNIV DAVIS DEPT OF PHYSICAL EDUCATION

(U) Three-Dimensional Photochemical Machining with Lasers.

(U) The Influence of Differential Physical Conditioning Regimens on Simulated Aerial Combat Maneuvering Tolerance.

DESCRIPTIVE NOTE: Quarterly research and development status rept. no. 4, 1 May-31 Jul 83.

NOV 83 8P

NOV 82 9P

PERSONAL AUTHORS: Schwerzel, R. E. ;

PERSONAL AUTHORS: Epperson, W. L. ; Burton, R. R. ; Bernauer, E. M. ;

CONTRACT NO. F49620-82-C-0077

CONTRACT NO. AFOSR-78-3510

PROJECT NO. 2306

PROJECT NO. 2312

TASK NO. 82

TASK NO. A1

MONITOR: AFOSR
TR-84-0812MONITOR: AFOSR
TR-84-0786

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) Research on the development of new photoinitiator systems for spatially selective photochemical machining with lasers has continued smoothly and is progressing well. The porphyrin systems developed during the second quarter continue to look particularly promising. Further experiments on the 2-component photoinitiator systems comprised of 9,10-dibromoanthracene and naphthalene sulfonyl chloride have confirmed that photopolymerization can be selectively enhanced by 2-beam irradiation. This is the first report of a 2-photon, 2-component polymerization system, to our knowledge. (Author)

DESCRIPTORS: (U) *Machining, *Laser beams, Photochemical reactions, Polymerization, Porphyrins, Three dimensional, Chlorides, Naphthalenes, Sulfonyl halides

IDENTIFIERS: (U) Photoinitiators, WJAFOSR230682, PE61102F

SUPPLEMENTARY NOTE: Pub. in Aviation, Space, and Environmental Medicine, v53 n11 p1091-1097 Nov 82.

Reprint: The Influence of Differential Physical Conditioning Regimens on Simulated Aerial Combat Maneuvering Tolerance.

DESCRIPTORS: (U) *Physical fitness, *Acceleration tolerance, *Tolerances(Physiology), Pilots, Stress(Physiology), Comparison, Correlation, Aerial warfare, Maneuverability, Flight, Reprints

IDENTIFIERS: (U) WJAFOSR2312A1, PE61102F

AD-A145 792

AD-A145 790

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EV198

AD-A145 789 12/1

CALIFORNIA UNIV SANTA BARBARA INST FOR THE
INTERDISCIPLINARY APPLICATIONS OF ALGEBRA AND
COMBINATORICS

(U) Combinatorial Inequalities, Matrix Norms, and
Generalized Numerical Radial. II.

83 12P

PERSONAL AUTHORS: Goldberg, M.; Straus, E. G. ;

CONTRACT NO. AFOSR-83-0150

PROJECT NO. 2304

TASK NO. A3

MONITOR: AFOSR
TR-84-0789

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in General Inequalities 3, p195-
204 1983. See also AD-A084 825.

Reprint: Combinatorial Inequalities, Matrix Norms, and
Generalized Numerical Radial. II.

DESCRIPTORS: (U) *Combinatorial analysis, *Inequalities,
Matrices(Mathematics), Eigenvalues, Multiplication factor,
Reprints

IDENTIFIERS: (U) Norms, WUAFOSR2304A3, PE81102F

AD-A145 779 8/19

CALIFORNIA UNIV DAVIS DEPT OF PHYSICAL EDUCATION

(U) The Role of Physical and Physiological Capacities and
Their Modification on the Tolerance to Various Stress
Experienced by Air Force Personnel.

DESCRIPTIVE NOTE: Final rept..

JUN 84 180P

PERSONAL AUTHORS: Bernauer, E.; Mole, P. A.; Adams, W. C. ;

CONTRACT NO. AFOSR-78-3510

PROJECT NO. 2312

TASK NO. A1

MONITOR: AFOSR
TR-84-0787

UNCLASSIFIED REPORT

31 Jun 84

ABSTRACT: (U) The final report addresses advances in
anthropometric and physical conditioning that will
improve physical fitness and orthostatic tolerance
related to improvement in handling high sustained G (HGS)
stress. Topics include: (1) Man, exercise and orthostasis,
(2) Animal model response to HGS; and Man, thermal stress
and physical performance. Five years of work are
condensed in the report.

DESCRIPTORS: (U) *Stress(Physiology),
*Tolerances(Physiology), Air Force personnel, High
acceleration, Physical fitness, Capacity(Quantity),
Orthostatism, Performance(Human), Thermal stresses

IDENTIFIERS: (U) PE81102F, WUAFOSR2312A1

AD-A145 789

UNCLASSIFIED

AD-A145 779

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A145 772 12/1 9/3

AD-A145 766 9/1

UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES DEPT OF ELECTRICAL ENGINEERING

GENERAL ELECTRIC CORPORATE RESEARCH AND DEVELOPMENT SCHENECTADY NY

(U) Unification of Wiener-Hopf and State Space Approaches to Quadratic Optimal Control.

(U) Novel Techniques for the Fabricating and Characterization of GaAs MIS (Metal Insulator Semiconductor) Structures.

JUL 84 7P

DESCRIPTIVE NOTE: Final rept. 1 Jan 83-29 Feb 84.

PERSONAL AUTHORS: Safonov, M. G. ; Sideris, A. ;

CONTRACT NO. AFOSR-80-0013

JUN 84 28P

PERSONAL AUTHORS: Ehle, R. S. ; Morris, W. G. ; Bailiga, B. J. ;

PROJECT NO. 2304

REPORT NO. SRD-84-1001

TASK NO. A1

CONTRACT NO. F49620-83-C-0031

MONITOR: AFOSR TR-84-0838

PROJECT NO. 2306

UNCLASSIFIED REPORT

TASK NO. B1

SUPPLEMENTARY NOTE: Pub. in Proceedings of DIGITECH '84, Patras, Greece, 9-12 Jul 84.

MONITOR: AFOSR TR-84-0780

Reprint: Unification of Wiener-Hopf and State Space Approaches to Quadratic Optimal Control.

UNCLASSIFIED REPORT

DESCRIPTORS: (U) *Control systems, *Closed loop systems, Riccati equation, Optimization, Stability, Solutions(General), Reprints

ABSTRACT: (U) Organometallic chemical vapor deposition (OMCVD) of Al2O3 on GaAs has been investigated as a means of fabricating metal-insulator-semiconductor field effect transistors (MISFET). Deposition at temperatures less than 400C forms high-quality films of Al2O3. Diffusion can alter the composition during high-temperature anneals. In-situ etching of the GaAs just prior to depositing the Al2O3 markedly reduced surface generation velocities, but inversion at the interface was not conclusively demonstrated. (Author)

IDENTIFIERS: (U) Wiener Hopf method, PE61102F, WUAFOSR2304A1

DESCRIPTORS: (U) *Semiconductor devices, *Field effect transistors, *Metal oxide semiconductors, Electrical insulation, Metal contacts, Organometallic compounds, Vapor deposition, Gallium arsenides, Aluminum oxides, Fabrication

IDENTIFIERS: (U) *MISFET(Metal Insulator Semiconductor Field Effect Transistors), PE61102F

AD-A145 772

AD-A145 766

UNCLASSIFIED

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A145 759 12/1

UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES DEPT OF ELECTRICAL ENGINEERING

(U) Multivariable L-Infinity Sensitivity Optimization and Harkel Approximation,

JUN 83 3P

PERSONAL AUTHORS: Safonov, M. G. ; Verma, M. S. ;

CONTRACT NO. AFOSR-80-0013

PROJECT NO. 2304

TASK NO. A1

MONITOR: AFOSR
TR-84-0806

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Proceedings of the American Control Conference, San Francisco, CA, 22-24 Jun 83.

ABSTRACT: (U) The problem of designing a feedback compensator to minimize a weighted L-infinity norm of the sensitivity function of a MIMO linear time invariant system is considered. The problem is solved by establishing its equivalence to the different but related problem of multivariate zeroeth order optimal Harkel approximation solved recently by Kung and Lin. (Author)

DESCRIPTORS: (U) *Control theory, Compensators, Feedback, Multivariate analysis, Functions, Sensitivity, Optimization

IDENTIFIERS: (U) Feedback compensators, Harkel approximation, WUAFOSR2304A1, PEB1102F

AD-A145 759

UNCLASSIFIED

AD-A145 758 12/1

SYSTEMS CONTROL TECHNOLOGY INC PALO ALTO CA

(U) An Output Error Method for Reduced Order Controller Design,

JUL 84 4P

PERSONAL AUTHORS: Porat, B. ; Friedlander, B. ;

CONTRACT NO. F49620-81-C-0051

PROJECT NO. 2304

TASK NO. A6

MONITOR: AFOSR
TR-84-0845

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in IEEE Transactions on Automatic Control, VAC-29 n7 p629-631 Jul 84.

Reprint: An Output Error Method for Reduced Order Controller Design.

DESCRIPTORS: (U) *Computations, *Control systems, Least squares method, Linear systems, Closed loop systems, Transfer functions, Reprints

IDENTIFIERS: (U) PEB1102F, WUAFOSR2304A6

AD-A145 758

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DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. EVI198

AD-A145 755 9/2 12/1

AD-A145 748 17/2 12/1

PITTSBURGH UNIV PA CENTER FOR MULTIVARIATE ANALYSIS

PRINCETON UNIV NJ DEPT OF ELECTRICAL ENGINEERING AND
COMPUTER SCIENCE

(U) Computer Equipment for Research in Statistics.

(U) Signal Processing Algorithms.

DESCRIPTIVE NOTE: Final scientific rept. 15 Jun 83-14 Jun
84.

DESCRIPTIVE NOTE: Interim scientific rept. 1 Aug 82-30
Jul 83.

AUG 84 5P

OCT 83 4P

PERSONAL AUTHORS: Krishniah, P. R. ;

PERSONAL AUTHORS: Liu, B. ;

CONTRACT NO. AFOSR-83-0226

CONTRACT NO. AFOSR-81-0186

PROJECT NO. 2304

PROJECT NO. 2304

TASK NO. A5

TASK NO. A6

MONITOR: AFOSR
TR-84-0822

MONITOR: AFOSR
TR-84-0795

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) This grant purchased computer equipment to
support basic research in multivariate analysis at the
University of Pittsburgh. Some of the research areas to
be supported by this equipment include the development of
new methodology in multivariate analysis, techniques of
data analysis in flight control problems, pattern
recognition, and reliability and quality assurance.
(Author)

ABSTRACT: (U) This report summarizes research in the
areas of autoregressive model for spectrum estimation,
steady state output error of the least mean square, and
extrapolation of bandlimited signal in discrete-time.
Papers produced during this period are listed.

DESCRIPTORS: (U) *Computers, *Statistical analysis,
Multivariate analysis, Computer applications, Pattern
recognition, Flight control systems, Reliability, Quality
assurance, Air Force research

DESCRIPTORS: (U) *Signal processing, Least squares
method, Estimates, Spectra, Extrapolation, Algorithms,
Mathematical models

IDENTIFIERS: (U) PE81102f, WUAFOSR2304A5

IDENTIFIERS: (U) PE81102F, WUAFOSR2304A6

AD-A145 755

AD-A145 748

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OTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A145 738

17/2 12/1

AD-A145 737 12/1

RANDOM APPLICATIONS INC MONTROSE CO

MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF ELECTRICAL
ENGINEERING

(U) On M-ary DPSK (Differential Phase-Shift Keying)
Transmission Over Terrestrial and Satellite Channels.

JUL 84 11P

PERSONAL AUTHORS: Pawls, R. F. ;

CONTRACT NO. F49620-83-C-0085

PROJECT NO. 2304

TASK NO. A6

MONITOR: AFOSR
TR-84-0794

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in IEEE Transactions on
Communications, vCOM-32 n7 p752-761 Jul 84.

Reprint: On M-ary DPSK (Differential Phase-Shift Keying)
Transmission Over Terrestrial and Satellite Channels.

DESCRIPTORS: (U) *Phase shift keyers, *Computations,
*Communication and radio systems, Uplinks, Downlinks,
Repeaters, Channels, Satellite communications, Reprints

IDENTIFIERS: (U) DPSK(Differential Phase Shift Keying),
Terrestrial channels, PE61102F, WUAFOSR2304A6

DESCRIPTIVE NOTE: Final rept. 1 Jul 83-30 Jun 84.

AUG 84 13P

PERSONAL AUTHORS: Moses, J. ;

CONTRACT NO. AFOSR-80-0250

PROJECT NO. 2304

TASK NO. A4

MONITOR: AFOSR
TR-84-0785

UNCLASSIFIED REPORT

ABSTRACT: (U) During this period the single investigator refined his technique for symbolic integration, implemented it in a computer program in MACSYMA, and produced and presented a paper describing his achievement entitled, An experiment toward a general quadrature for second order linear ordinary differential equations by symbolic computation. A measure of his success is that he was able to integrate successfully 90% of the 542 equations in Kamke's famous table. (Since 50 of these equations involved arbitrary functions, etc., for which the programs was not designed, the success rate is more appropriately 96%.)

DESCRIPTORS: (U) *Algebra, Integration, Symbols, Air Force research, Computer programs, Numerical quadrature, Linear differential equations, Computations

IDENTIFIERS: (U) Symbolic integration, PE61102F,
WUAFOSR2304A4

AD-A145 738

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AD-A145 737

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DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. EVI198

AD-A145 729 12/1 20/3

AD-A145 727 5/10

UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES DEPT OF
ELECTRICAL ENGINEERING

NOVA TECHNICAL INC TARZANA CA*

(U) Input-Output Stability Analysis with Magnetic
Hysteresis Non-Linearity - A Class of Multipliers,

(U) An Investigation of the Use of Steady-State Evoked
Potentials for Human Performance and Workload
Assessment and Control.

JUN 84 8P

DESCRIPTIVE NOTE: Annual rept. 15 Jun 83-14 Jun 84.

PERSONAL AUTHORS: Safonov, M. G. ; Karimlou, K. ;

JUN 84 20P

CONTRACT NO. AFOSR-80-0013, NSF-INT83-02754

PERSONAL AUTHORS: Moise, S. L. , Jr. ;

PROJECT NO. 2304

CONTRACT NO. F49820-83-C-0102

TASK NO. A1

PROJECT NO. 2313

MONITOR: AFOSR
TR-84-0803

MONITOR: AFOSR

TR-84-0770

UNCLASSIFIED REPORT

ABSTRACT: (U) A class of positive real multipliers is
obtained to establish frequency domain conditions for
stability of feedback systems containing ferromagnetic
hysteresis non-linearity. (Author)

UNCLASSIFIED REPORT

ABSTRACT: (U) This report describes the status of this
AFOSR sponsored research program during the reporting
period. This research program is designed to examine high
frequency (40-80 Hz) Steady-State Evoked Potentials as a
tool for providing information about human sensory and
performance capability. In particular, a measure of
relative transmission time through the visual system is
to be evaluated. This report details the configuration of
the test and data collection facility and reports the
results of control and pilot studies. Some of this data
suggests that there may be a frequency 'masking' effect
in the visual system when multiple visual frequencies are
simultaneously presented. If this is verified, it may
represent a previously unobserved basic property of the
visual system response to flashing stimuli.

DESCRIPTORS: (U) *Mathematical models, *Hysteresis,
Input output models, Ferromagnetism, Nonlinear systems,
Stability, Magnetic properties, Equations

DESCRIPTORS: (U) *Workload, *Performance(Human), Vision,
High frequency, Stimuli, Masking, Response(Biology), Work
measurement, Electrophysiology

IDENTIFIERS: (U) Evoked potential, WUAFOSR2313A4,
PE81102F

AD-A145 729

AD-A145 727

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DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. EVI198

AD-A145 725 12/1 9/2

AD-A145 723 11/8

MARYLAND UNIV COLLEGE PARK CENTER FOR AUTOMATION
RESEARCH

PRATT AND WHITNEY AIRCRAFT GROUP EAST HARTFORD CT

(U) The Prism Machine: An Alternative to the Pyramid.

(U) Deformation and Fracture of Advanced Anisotropic
Superalloys.

DESCRIPTIVE NOTE: Technical rept..

DESCRIPTIVE NOTE: Interim technical rept..

JUL 84 18P

NOV 77 17P

PERSONAL AUTHORS: Rosenfeld, A. ;

PERSONAL AUTHORS: Duhl, D. N. ; Gell, M. L. ; Giamel, A. F. ;
Leverant, G. R. ;

REPORT NO. CAR-TR-70, CS-TR-1418

REPORT NO. PWA-FR-9371

CONTRACT NO. F49620-83-C-0082

CONTRACT NO. F4620-76-C-0028

PROJECT NO. 2304

PROJECT NO. 2308

TASK NO. A7

TASK NO. A1

MONITOR: AFOSR

MONITOR: AFOSR
TR-84-0839

UNCLASSIFIED REPORT

ABSTRACT: (U) The prism machine is a stack of n cellular arrays, each of size $(2$ to the n power $\times 2$ to the n power). Cell (i,j) on level k is connected to cells (i,j) , $(i+2$ to the k power $,j)$, and $(i,j+2$ to the k power) on level $k+1$, $1 < k < n$, where the sums are modulo 2 to the n power. Such a machine can perform various operations (e.g., Gaussian convolutions or least-squares polynomial fits) on image neighborhoods of power-of-2 sizes in every position in $O(n)$ time, unlike a pyramid machine which can do this only in sampled positions. It can also compute the discrete Fourier transform in $O(n)$ time.

DESCRIPTORS: (U) *Computer architecture, *Parallel processing, *Image processing, Pyramids, Arrays, Least squares method, Fourier transformation, Histograms

IDENTIFIERS: (U) *Prism machines, Cellular arrays, PEG1102F, WUAFOSR2304A7

AD-A145 725

AD-A145 723

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UNCLASSIFIED REPORT

ABSTRACT: (U) A study was conducted to determine the effects of crystallographic orientation and rhodium content on the creep behavior of a single crystal nickel-base superalloy. Creep tests conducted at 982 C and 220 MPa (32 ksi) on Alloy 444 single crystals show that there is an increase in creep strength as the specimen axis is varied from (001) to 28 C from (001). This orientation effect is favorable for use of nickel-base superalloy single crystal as turbine blade materials. Substitution of rhodium for tungsten in Alloy 444 increases creep strength. The mechanism for this effect is the subject of a continuing investigation.

DESCRIPTORS: (U) Superalloys, Fracture (Mechanics), Deformation, Anisotropy, Creep strength, Crystals, Orientation (Direction), Nickel alloys, Single crystals, Tungsten, Rhodium, Turbine blades

IDENTIFIERS: (U) PEG1102F, WUAFOSR2306A1

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. EVI198

AD-A145 722 12/1 9/3

AD-A145 712 6/16 5/10

UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES DEPT OF
ELECTRICAL ENGINEERING

HARVARD MEDICAL SCHOOL BOSTON MA DEPT OF PHYSIOLOGY AND
BIOPHYSICS

(U) Multivariable Stability-Margin Optimisation with
Decoupling and Output Regulation.

(U) Mathematical Models of the Circadian Sleep-Wake Cycle.

DESCRIPTIVE NOTE: Final scientific rept. 1 May 81-30 Nov
82.

NOV 82 8P

PERSONAL AUTHORS: Safonov, M. G.; Chen, B. S. ;

MAY 84 228P

CONTRACT NO. AFOSR-80-0013

PERSONAL AUTHORS: Moore-Ede, M. C. ;

PROJECT NO. 2304

CONTRACT NO. AFOSR-81-0133

TASK NO. A1

PROJECT NO. 2312

MONITOR: AFOSR
TR-84-0804

TASK NO. A1

MONITOR: AFOSR
TR-84-0781

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in IEEE Proceedings, v129 pt. D
no p276-282 Nov 82.

UNCLASSIFIED REPORT

Reprint: Multivariable Stability-Margin Optimisation with
Decoupling and Output Regulation.

ABSTRACT: (U) This contract funded a Satellite Symposium
on the Mathematical Modeling of Circadian Systems which
was held on June 21, 1981 in conjunction with the Annual
Meeting of the Association for the Psychophysiological
Study of Sleep (APSS) from June 17-21, 1981, at Dunfey's
Hyannis Hotel on Cape Cod, Massachusetts. The Satellite
Symposium brought together the leading investigators
concerned with modeling the circadian system to ensure
that the various proposed models were critically reviewed
and their strengths and weaknesses in predicting periodic
biological phenomena were fully understood. The papers of
each participant and an edited transcription of the
discussion were published as a book entitled
'Mathematical Models of the Circadian Sleep-Wake Cycle'
by Raven Press in 1984. The published volume serves as an
important source of all those who are concerned about the
temporal organization of human and animal behavior and
physiology. (Author)

DESCRIPTORS: (U) *Multivariate analysis, *Control
systems, Control theory, Feedback, Decoupling,
Optimization, Output, Stability, Sensitivity, Reprints

IDENTIFIERS: (U) PE81102F, WJAFOSR2304A1

DESCRIPTORS: (U) *Circadian rhythms, *Sleep,
*Mathematical models, Models, Simulation, Biomedicine,
Sleep deprivation, Humans, Performance(Human), Behavior,
Jet lag, Pacemakers, Oscillators, Biological rhythms

IDENTIFIERS: (U) *Sleep-wake cycle, Human sleep,
PE81102F, WJAFOSR2312A1

AD-A145 722

AD-A145 712

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A145 709

12/1

AD-A145 705

20/11

NORTH CAROLINA UNIV AT CHAPEL HILL DEPT OF STATISTICS

UNITED TECHNOLOGIES RESEARCH CENTER EAST HARTFORD CT

(U) Estimation in Nonlinear Time Series Model II: Some Nonstationary Series.

(U) Plastic Strain Localization in Superalloy Single Crystals.

DESCRIPTIVE NOTE: Technical rept.,

DESCRIPTIVE NOTE: Annual rept. 1 May 83-30 Apr 84.

JUL 84

45P

MAY 84

38P

PERSONAL AUTHORS: Tjostheim, D. ;

PERSONAL AUTHORS: Anton, D. L. ; Giamel, A. F. ;

REPORT NO. TR-71

REPORT NO. UTRC/R84-916534-1

CONTRACT NO. F49620-82-C-0008

CONTRACT NO. F49620-83-C-0104

PROJECT NO. 2304

PROJECT NO. 2308

TASK NO. A5

TASK NO. A1

MONITOR: AFOSR

MONITOR: AFOSR

TR-84-0827

TR-84-0775

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also rept. dtd Jul 80, AD-A145 814.

ABSTRACT: (U) In an earlier paper a general framework was introduced for analyzing estimates in stationary nonlinear time series models. In this present paper the framework is enlarged to include certain nonstationary and nonlinear series. General conditions for strong consistency and asymptotic normality are derived both for conditional least squares and maximum likelihood type estimates. Examples are taken from threshold autoregressive, random coefficient autoregressive and doubly stochastic (dynamic state space) models. The emphasis in the examples is on conditional least squares estimates. (Author)

DESCRIPTORS: (U) *Time series analysis, Least squares method, Asymptotic normality, Stochastic processes, Estimates, Theorems

IDENTIFIERS: (U) Autoregressive models, PE81102F, MUAFOSR2304A5

AD-A145 709

AD-A145 705

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ABSTRACT: (U) Single crystals of a model Ni-base superalloy were heat treated so as to obtain two different gamma prime distributions; solutioned and quenched and fully aged. Surface replicas of slip occurring after small amounts of plastic deformation were analyzed using TEM techniques as a function of crystal orientation. Slip bands were clearly composed of a large number of fine slip lines. These slip lines were spaced approximately 50 nm apart. A model which describes the mechanism by which these slip lines spread and form slip bands is proposed and substantiated with TEM thin foil micrographs of the deformed alloy. (Author)

DESCRIPTORS: (U) *Plastic deformation, *Strain(Mechanics), *Plastic properties, *Superalloys, Single crystals, Nickel alloys, Orientation(Direction)

IDENTIFIERS: (U) Slip, Localization, PE81102F, MUAFOSR2306A1

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. EVI198

AD-A145 702 6/16 5/10

AD-A145 700 12/1 20/6

TEXAS UNIV AT ARLINGTON

GEORGIA INST OF TECH ATLANTA SCHOOL OF ELECTRICAL
ENGINEERING

(U) Eyelid Motion Sequences Predictive of Decision Errors.

(U) Design of Edge Detectors for Reduced Images.

DESCRIPTIVE NOTE: Final rept. Apr 83-Aug 84.

DESCRIPTIVE NOTE: Final technical rept. 1 Jun 83-31 May 84.

AUG 84 13P

PERSONAL AUTHORS: Lobb, M. L. ;

JUL 84 43P

CONTRACT NO. AFOSR-83-0129

PERSONAL AUTHORS: Healy, D. J. ;

PROJECT NO. 2313

CONTRACT NO. AFOSR-83-0152

TASK NO. D9

PROJECT NO. 2304

MONITOR: AFOSR

TASK NO. D9

TR-84-0773

MONITOR: AFOSR

TR-84-0815

UNCLASSIFIED REPORT

ABSTRACT: (U) Nine normal human subjects were measured by electrooculographic and video tape of the eyes during performance on a human/animal analog of the serial probe recognition task. The task was modified to distinguish attention (the missed signal) errors from decision (failure to make same versus different discrimination) errors. Two types of eyelid closing and reopening sequences were observed to be progressive with time-on-task with the earlier, Type I sequence being indicative of correct responses. The velocity of the eyelid in motion over the pupil also significantly discriminated decision correct from decision error trials. The results were interpreted to support the hypothesis that information processing function progressively deteriorates over time-on-task and is indicated by variations in oculomotor patterns.

DESCRIPTORS: (U) *Eye movements, *Visual perception, Decision making, Errors, Information processing, Electrooculography, Performance(Human), Recognition, Discrimination, Accuracy

IDENTIFIERS: (U) Eyelid motion, PE81102F

AD-A145 702

AD-A145 700

UNCLASSIFIED

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UNCLASSIFIED REPORT

ABSTRACT: (U) The development of algorithms to extract informational features from imagery is an area of active research. These algorithms enable computerized devices to automatically locate and identify objects in the field of view of a sensor. An important Air Force application is automatic target identification and weapon guidance. Edges in an image contain much of the information necessary to classify objects. This investigation has centered on finding methods for reducing an image so as to maximize the retention of edge information which was subsequently extracted. The Hotelling transform which reduces image data so as to minimize intensity mean-square error (IMSE) in the reconstructed image was also found to have significantly better edge retaining ability than simple averaging. The reconstructed edges were quantitatively compared to those in the original images using MSE and receiver operating characteristic based measures. One such measure used was the gradient mean-square error (GMSE). Both the reconstructed IMSE and GMSE using the Hotelling transform tend to decrease as the encoding block size increases. An equation relating GMSE to IMSE was developed. For image gradient blocks that are independently reconstructed, the linear transformation matrix A that minimizes the reconstructed GMSE and in that sense maximizes edge retention was derived. (Author)

UNCLASSIFIED

OTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A145 700 CONTINUED

AD-A145 695 20/6 9/1

DESCRIPTORS: (U) *Algorithms, *Image processing, *Edges, *Detectors, Coding, Extraction, Automatic, Target recognition, Target acquisition, Data reduction, Retention(General), Transformations(Mathematics), Air Force planning

CALIFORNIA UNIV IRVINE DEPT OF ELECTRICAL ENGINEERING
(U) Guided-Wave Optic Devices for Integrated Optic Information Processing.

IDENTIFIERS: (U) *Image reduction, Mean square error, Hotelling transform, PEG1102F, WJAFQSR230409

DESCRIPTIVE NOTE: Annual scientific rept. 30 Jan 83-30 Jan 84.

IAC NO. GC-840931

AUG 84 48P

IAC DOCUMENT TYPE: GACIAC - MICROFICHE --

PERSONAL AUTHORS: Tsai, C. S. ;

IAC SUBJECT TERMS: G--(U)Edge detection, Feature extraction, Algorithms, Image processing, Data reduction, Edge extraction, Images, Pixels, Transformations, Mathematics.;

CONTRACT NO. AFOSR-80-0288

PROJECT NO. 2305

TASK NO. B1

MONITOR: AFOSR
TR-84-0772

UNCLASSIFIED REPORT

ABSTRACT: (U) Integrated or Guided-Wave Optics is an emerging technology that has the ultimate potential of integrating miniature optical components such as laser light sources, modulators, switches, deflectors, lenses, prisms, and detectors in a common substrate. The resultant integrated optic circuits and subsystems are expected to have a number of advantages over the conventional bulk optical systems in certain areas of applications. Some of the advantages include smaller size and lighter weight, wider bandwidth, lesser electrical drive power requirement, greater signal accessibility, and integratability. The integrated optic circuits are also expected to possess advantages in stability, reliability, ruggedness, and ultimate cost. It has been recognized for some time that the most immediate applications of integrated optics lie in the areas of wideband multichannel communications and signal processing (for both civilian applications such as fiber optic systems and military hardware such as sensors and radars). The general objectives of this research program are to study the basic physical mechanisms/phenomenon of new and novel guided-wave devices with application to wideband multichannel optical information processing. The major tasks that have been carried out during this program year include theoretical and experimental research on the following two major topics: (1) Wideband

AD-A145 700

AD-A145 695

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DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. EVI198

AD-A145 895 CONTINUED

Guided-Wave Acoustooptic Interactions and Devices in GaAs-ZnO composite waveguides, and (2) Planar Guided-Wave Magneto-Optic Bragg Diffraction and Devices in YIG-GGG Waveguides.

DESCRIPTORS: (U) *Optical equipment components, *Optical circuits, *Waveguides, *Information processing, Integrated circuits, Integration, Miniaturization, Broadband, Multichannel communications, Signal processing, Acoustooptics, Substrates, Lightweight, Magnetostatics, Surface waves, Gallium arsenides, Zinc oxides, Magneto-optics, Diffraction

IDENTIFIERS: (U) *Guided wave optics, WUAFOSR2305B1, PE61102F

AD-A145 874 20/6 20/1 9/5 12/1

BATTELLE COLUMBUS LABS OH
(U) Optical Waveguide Spatial Filters.

DESCRIPTIVE NOTE: Final rept.,

MAY 84 62P

PERSONAL AUTHORS: Verber, C. M.; Kenan, R. P.; Busch, J. R.;
Parmenter, M.;

CONTRACT NO. F49620-79-C-0044

PROJECT NO. 2305

TASK NO. B1

MONITOR: AFOSR
TR-84-0811

UNCLASSIFIED REPORT

ABSTRACT: (U) This report deals with the continued development of analog computational devices using planar Ti-indiffused LiNbO3 waveguide technology. A previously developed integrated optical spatial light modulator is used to implement a electrical-digital to optical-analog converter. Designs for matrix-vector and matrix-matrix multipliers are developed and detailed characterization of an electrooptic herringbone electrode structure which is used in these devices is presented. (Author)

DESCRIPTORS: (U) *Spatial filtering, *Optical waveguides, *Digital to analog converters, *Surface acoustic wave devices, *Optical correlators, *Light modulators, Programmed instruction, Parallel processing, Signal processing, Analog systems, Fourier transformation, Integrated circuits, Laser beams, Optical circuits, Computations, Electrodes, Digital systems, Transducers, Clocks, Structural properties, Electrooptics

IDENTIFIERS: (U) Analog multiplication, Numerical optical computing, Diffraction orders, Matrix multiplication, Vector multiplication, Beam stops, Integrated optics, Herringbones, Grating arrays, Analog registers, Electrooptic gratings, Systolic processors, Multipliers, PE61102F, WUAFOSR2305B1

AD-A145 895

AD-A145 874

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A145 673 12/1

AD-A145 668 11/2 13/8

NORTH CAROLINA UNIV AT CHAPEL HILL INST OF STATISTICS

SRI INTERNATIONAL MENLO PARK CA

(U) An Asymptotic Theory for Logistic Regression When Some Predictors Are Measured with Error.

(U) Silicon Nitride Joining.

DESCRIPTIVE NOTE: Technical rept..

DESCRIPTIVE NOTE: Annual rept. 1 Feb 83-31 Mar 84.

DEC 83 32P

MAY 84 77P

PERSONAL AUTHORS: Stefanski, L. A. ; Carroll, R. J. ;

PERSONAL AUTHORS: Johnson, S. M. ; Roucliffe, D. J. ;

REPORT NO. NIMED SER-1842

CONTRACT NO. F49620-81-K-0001

CONTRACT NO. F49620-82-C-0009

PROJECT NO. 2306

MONITOR: AFOSR
TR-84-0840

TASK NO. A2

MONITOR: AFOSR
TR-84-0778

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Prepared in cooperation with Cornell Univ., Ithaca, NY.

ABSTRACT: (U) This document considers a local measurement error theory for logistic regression which is applied to four different methods: ordinary logistic regression without accounting for measurement error, a functional maximum likelihood estimate, an estimate based on linearizing the logistic function and an estimator conditioned on certain appropriate sufficient statistics. This asymptotic theory includes a bias-variance trade off, which is used to construct new estimators with better asymptotic and small sample properties. (Author)

ABSTRACT: (U) The results obtained in the third year of a continuing investigation into a method of joining silicon nitride with an oxide glass are described. Mechanical behavior of joints at room temperature and the criteria for strong joints are detailed. Two approaches were taken to strengthen the joints: heat treatments to crystallize the glass in the joint and surface preparation. The high temperature behavior of various Si3N4/glass systems was investigated by means of high temperature mechanical tests, mass spectrometry, theoretical calculations, and mass transport studies.

DESCRIPTORS: (U) *Regression analysis, Estimates, Errors, Probability, Monte Carlo method, Theorems

DESCRIPTORS: (U) *Silicon nitrides, *Joining, Glass, Heat treatment, Mechanical properties, Mass spectrometry, Surfaces, Preparation, High temperature, Oxides, Joints

IDENTIFIERS: (U) Likelihood estimation, Asymptotic theory, Logistic regression

IDENTIFIERS: (U) PE61102F, WUAFOSR2308A2, LPN-SRI-PYU-2527

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A145 861 9/2

AD-A145 650 12/1

STATE UNIV OF NEW YORK AT STONY BROOK DEPT OF COMPUTER SCIENCE

FLORIDA STATE UNIV TALLAHASSEE DEPT OF STATISTICS

(U) Summary of Research, Grant AFOSR-81-0197, 15 June 1983
- 14 June 1984.

(U) Tests for Properties of the Percentile Residual Life Function.

DESCRIPTIVE NOTE: Interim rept.,

83 34P

AUG 84 5P

PERSONAL AUTHORS: Joe, H. ; Proschan, F. ;

PERSONAL AUTHORS: Bernstein, A. J. ;

CONTRACT NO. F49620-82-K-0007

CONTRACT NO. AFOSR-81-0197

PROJECT NO. 2304

PROJECT NO. 2304

TASK NO. A5

TASK NO. A2

MONITOR: AFOSR
TR-84-0883

MONITOR: AFOSR
TR-84-0831

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) The research performed under this grant was concerned with distributed languages and algorithms.

DESCRIPTORS: (U) *Algorithms, *Programming languages, Distributed data processing, Data bases, Networks, Computer files

IDENTIFIERS: (U) Distributed algorithms, PE81102F, WJAFOSR2304A2

SUPPLEMENTARY NOTE: Pub. in Commun. Statist. - Theor. Meth., v12 n10 p1087-1119 1983.

Reprint: Tests for Properties of the Percentile Residual Life Function.

DESCRIPTORS: (U) *Distribution functions, *Statistical tests, Statistical inference, Reprints

IDENTIFIERS: (U) *Life functions, *Life distribution, WJAFOSR2304A5, PE81102F

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A145 640 9/2

AD-A145 639 12/1

OAKLAND UNIV ROCHESTER MI SCHOOL OF ENGINEERING

RENSSELAER POLYTECHNIC INST TROY NY DEPT OF MATHEMATICAL SCIENCES

(U) Fault Tolerant Computing Research.

DESCRIPTIVE NOTE: Final rept. 1 Jul 80-30 Jun 83.

SEP 83 12P

DESCRIPTIVE NOTE: Interim rept. 1 Jun 83-31 May 84.

PERSONAL AUTHORS: Pradhan, D. K. ;

AUG 84 21P

CONTRACT NO. AFOSR-80-0217

PERSONAL AUTHORS: Flaherty, J. E. ;

PROJECT NO. 2304

CONTRACT NO. AFOSR-80-0192

TASK NO. A6

PROJECT NO. 2304

MONITOR: AFOSR
TR-84-0841

MONITOR: AFOSR

TR-84-0844

UNCLASSIFIED REPORT

ABSTRACT: (U) During this reporting period, three main topics were investigated: (1) Design of fault tolerant computers using read-only memories as basic building blocks; (2) Design of programmable logic arrays and sequential networks for testability; and (3) Design of fault tolerant multiprocessor network architectures. Some titles of the resulting papers are: Sequential network design using extra inputs for fault detection; A class of unidirectional error correcting codes; A uniform representation of permutation networks used in memory processor interconnections; and A fault tolerant communication architecture for distributed systems.

DESCRIPTORS: (U) *Fault tolerant computing, Networks, Permutations, Read only memories, Circuit interconnections, Memory devices, Error correction codes, Multiprocessors

IDENTIFIERS: (U) PE81102F, WUAFOSR2304A6

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ABSTRACT: (U) During this period research was continued on the development and application of numerical methods for singularly-perturbed (or stiff) boundary value problems for ordinary differential equations and initial-boundary value problems for partial differential equations. The author concentrated most heavily on extensions to the adaptive finite element methods for partial differential equations. In particular, the stability of several mesh moving schemes was analyzed and local refinement techniques developed. The author also has some encouraging preliminary results on mesh moving methods in two dimensions. The investigators are applying their methods to several interesting physical problems, such as elastic-plastic solids, combustion, and a nonlinear Schrodinger equation which exhibits self focusing. (Author)

DESCRIPTORS: (U) *Boundary value problems, *Numerical methods and procedures, Finite element analysis, Differential equations, Partial differential equations, Perturbation theory

IDENTIFIERS: (U) Mesh moving methods, PE81102F, WUAFOSR2304A3

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

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AD-A145 638

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BROWN UNIV PROVIDENCE RI LEFSCHETZ CENTER FOR DYNAMICAL SYSTEMS

MICHIGAN UNIV ANN ARBOR PARTICLE BEAM RESEARCH LAB

(U) Neutral Beam Interactions with Materials.

(U) Control and Identification of Time Varying Systems.

DESCRIPTIVE NOTE: Interim rept. 30 Jun 83-29 Jun 84, Annual rept. 1 Jun 83-31 May 84.

JUN 84 82P

AUG 84 8P

PERSONAL AUTHORS: Pearson, A. E. ;

PERSONAL AUTHORS: Ong, R. S. ; Duderstadt, J. J. ; Gilgenbach, R. W. ;

CONTRACT NO. AFOSR-82-0230

CONTRACT NO. AFOSR-80-0029

PROJECT NO. 2304

PROJECT NO. 2301

TASK NO. A1

TASK NO. A7

MONITOR: AFOSR

MONITOR: AFOSR
TR-84-0842

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) Current research is summarized for the parameter identification of a class of polynomial differential systems via the modulating function method. The underlying computations involve calculating a finite number of Fourier coefficients of the input-output data which can be determined using a fast Fourier transform algorithm. Current research is also described for devising stabilizing feedback control laws for a class of differential-delay systems using a spectral factorization of the state space.

DESCRIPTORS: (U) *Numerical methods and procedures, *Systems analysis, *Input output processing, Parameters, Identification, Computations, Polynomials, Control, Fast fourier transforms, Coefficients, Feedback, Air Force research

IDENTIFIERS: (U) *Time varying systems, Target acceleration, PE81102F, WUAFOSR2304A1

ABSTRACT: (U) A duopigatron has been used to accelerate ion and neutral beams of hydrogen, argon krypton, and xenon. An important class of ion source plasma instabilities has been investigated. The frequency of source plasma oscillations scale as the square root of ion mass. Ion extraction efficiencies for the various mass species show excellent agreement with theory in the transition from the space charge limited regime to the ion saturation regime. Displaced aperture grids with geometric focusing have been studied. Ruby laser ablation plasma experiments are underway and the ablation plasma parameters have been measured. Theoretical research has been directed towards developing analytic expressions for neutral beam stopping in solid matter in order to compare with ion beam stopping. A second part of the theoretical effort concerns coupling of three computational physics models to simulate the interaction between a neutral/ion beam with a target ablation plasma.

DESCRIPTORS: (U) *Ion sources, *Plasmas(Physics), *Ion beams, Particle beams, Stability, Plasma oscillations, Ions, Mass, Interactions, Laser beams

IDENTIFIERS: (U) Duopigatron, Neutral beams

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SEARCH CONTROL NO. EVI198

AD-A145 823

9/2

UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES DEPT OF
COMPUTER SCIENCE

(U) Yearly Report for Programming Productivity Enhancement
by the Use of Application Generators.

DESCRIPTIVE NOTE: Interim rept. 1 Jun 83-31 May 84,

AUG 84

5P

PERSONAL AUTHORS: Horowitz, E. ;

CONTRACT NO. AFOSR-82-0232

PROJECT NO. 2304

TASK NO. A2

MONITOR: AFOSR
TR-84-0813

UNCLASSIFIED REPORT

ABSTRACT: (U) During this period the investigator
produced three papers with titles, AdaRel --- A
relational extension of Ada, The design of office
information systems, and High-level input-output
facilities in database programming language. (Author)

DESCRIPTORS: (U) *Computer programming, *Computer
applications, *Productivity, Data bases, Interactions,
Information systems, Automation, Man computer interface,
Programming languages

IDENTIFIERS: (U) Ada language, AdaRel, WJAFOSR2304A2,
PE81102F

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AD-A145 822

9/2

STANFORD UNIV CA DEPT OF COMPUTER SCIENCE

(U) On 'Update Semantics and Relational Views'.

DESCRIPTIVE NOTE: Technical rept..

84

3P

PERSONAL AUTHORS: Keller, A. M. ;

CONTRACT NO. AFOSR-80-0212

PROJECT NO. 2304

TASK NO. A7

MONITOR: AFOSR
TR-84-0710

UNCLASSIFIED REPORT

ABSTRACT: (U) A shared database encompasses data of
interest to a variety of users. A database view provides
a class of users with an image of a portion of the data
presented according to the needs of these users. The
ability to translate updates specified against the view
into updates specified against the database is necessary
to allow more effective use of views. Since a user
accessing the database through a view has limited
knowledge of the entire domain of the database, it is
necessary to limit the effect on others of a particular
user's view update. Furthermore, there may be many ways
to translate a particular view update into database
updates. Bancillon and Spyrtatos propose the notion of a
constant complementary view, which partially solves the
problem of view updates by addressing these two issues.
The authors present a reasonable view update translator
that does not preserve any complement. This illustrates
the restrictive consequences of the requirement that a
complement remain constant. (Author)

DESCRIPTORS: (U) *Data bases, *Semantics, *Forecasting,
Data management, Theory, Translations, Sharing

IDENTIFIERS: (U) PE81102F

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EV1198

AD-A145 616 12/1 AD-A145 615 12/1
FLORIDA STATE UNIV TALLAHASSEE PITTSBURGH UNIV PA CENTER FOR MULTIVARIATE ANALYSIS

(U) Tests for Properties of Residual Life.
83 15P (U) Weighted Distributions Arising Out of Methods of
Ascertainment.

DESCRIPTIVE NOTE: Technical rept..

PERSONAL AUTHORS: Joe, H. ; Porschan, F. ;

JUL 84 45P

CONTRACT NO. F49620-82-K-0007

PERSONAL AUTHORS: Rao, C. R. ;

PROJECT NO. 2304

REPORT NO. TR-84-38

TASK NO. A5

CONTRACT NO. F49620-82-K-0001

MONITOR: AFOSR
TR-84-0664

PROJECT NO. 2304

UNCLASSIFIED REPORT

TASK NO. A5

SUPPLEMENTARY NOTE: Pub. in Communications in Statistics
Theory and Methods, v12 n10 p1121-1134 1983.

MONITOR: AFOSR
TR-84-0829

Reprint: Tests for Properties of Residual Life.

UNCLASSIFIED REPORT

DESCRIPTORS: (U) *Residuals, *Statistical tests,
*Distribution functions, Statistical inference,
Survival(General), Reprints

ABSTRACT: (U) The concept of weighted distributions can
be traced to the study of the effects of methods of
ascertainment upon the estimation of frequencies by
Fisher in 1934, and it was formulated in general terms by
the author in a paper presented at the first
International Symposium on Classical and Contagious
Distributions held in Montreal in 1963. Since then, a
number of papers have appeared on the subject. This paper
reviews some previous work, points out, through
appropriate examples, some situations where weighted
distributions arise and discusses the associated methods
of statistical analysis. The importance of specification
of the class of underlying probability distributions (or
stochastic model) in data analysis based on a detailed
knowledge of how data are obtained is emphasized. Failure
to take into account the conditions of ascertainment of
data can lead to wrong conclusions.

IDENTIFIERS: (U) *Residual life functions, WUAFOSR2304A5,
PE61102F

DESCRIPTORS: (U) *Weighting functions, *Distribution
functions, Statistical analysis, Probability distribution
functions, Mathematical models, Sampling, Truncation,
Population(Mathematics), Data acquisition, Tables(Data)

IDENTIFIERS: (U) *Weighted distributions, WUAFOSR2304A5,
PE61102F

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AD-A145 813 5/1 13/8 15/5

NORTH CAROLINA UNIV AT CHAPEL HILL CENTER FOR STOCHASTIC PRECESSES

CARNEGIE-MELLON UNIV PITTSBURGH PA ROBOTICS INST

(U) Estimation in Nonlinear Time Series Models I: Stationary Series.

(U) Constraint-Based Scheduling in an Intelligent Logistics Support System: An Artificial Intelligence Approach.

DESCRIPTIVE NOTE: Technical rept..

DESCRIPTIVE NOTE: Annual rept. 15 Mar 83-14 Mar 84,

JUL 80 41P

JUL 83 18P

PERSONAL AUTHORS: Tjoestheim,D. ;

PERSONAL AUTHORS: Fox,M. S. ;Smith,S. F. ;

REPORT NO. TR-70

CONTRACT NO. F49820-82-K-0017

CONTRACT NO. F49820-82-C-0008

PROJECT NO. 2304

TASK NO. A5

TASK NO. A2

MONITOR: AFOSR

MONITOR: AFOSR
TR-84-0828

TR-84-0826

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) A general framework for analyzing estimates in nonlinear time series models is developed. Ergodic strictly stationary series are treated. General conditions for strong consistency and asymptotic normality are derived both for conditional least squares and maximum likelihood type estimates. Examples are taken from exponential autoregressive, random coefficient autoregressive and bilinear time series models. Some nonstationary models and examples are treated in a sequel to this paper. (Author)

ABSTRACT: (U) This report summarizes the progress of research performed during the contract period from March 1982 to March 1984. A theory of hierarchical, opportunistic constraint-directed reasoning for the scheduling of job shops has been the focus of the research. In addition, new research in the areas of constraint-directed diagnosis, and reactive scheduling was initiated. An experimental software system, called ISIS, has continued its evolution and has been tested on simulated plant data.

DESCRIPTORS: (U) *Time series analysis, Asymptotic normality, Least squares method, Estimates, Mathematical models

DESCRIPTORS: (U) *Scheduling, *Shops(Work areas), *Logistics support, *Artificial intelligence, Operations research, Jobs, Manufacturing, Computer programs, Air Force research

IDENTIFIERS: (U) Likelihood estimation, PES1102F, WUAFOSR2304A5

IDENTIFIERS: (U) Job shops, ISIS computer program, WUAFOSR2304A2, PES1102F

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A145 612 CONTINUED

AD-A145 612 9/2 5/9

YALE UNIV NEW HAVEN CT DEPT OF COMPUTER SCIENCE

(U) Memory-Based Expert Systems.

future problems. These three principles of the memory-based expert systems model are being tested in several related projects.

DESCRIPTIVE NOTE: Interim rept. 15 Jan 83-14 Jan 84,

DESCRIPTORS: (U) *Artificial intelligence, *Learning, *Reasoning, Behavior, Economic models, Automatic, Interpreters, Computer programming, Data acquisition, Memory devices, Humans, Hypotheses, Predictions

AUG 84 11P

PERSONAL AUTHORS: Schank, R. C. ;

IDENTIFIERS: (U) *Expert system, Experienced personnel, WUAFOSR2304A2, PE81102F

CONTRACT NO. F49620-82-K-0010

PROJECT NO. 2304

TASK NO. A2

MONITOR: AFOSR TR-84-0814

UNCLASSIFIED REPORT

ABSTRACT: (U) During this period the investigators produced four papers with titles including, knowledge reorganization and reasoning style, Assignment of responsibility in ethical judgments, Generating hypotheses to explain prediction failures, and Learning, explanation, and a little history. They are developing a model of expertise that more closely resembles the way in which humans become experts, namely, through experience. They assume that the rule-base is not the primary repository of knowledge, but rather rules are derived from experience. Their model addresses the three problems given above as follows. (1) The knowledge-base is derived primarily from the enumeration of specific cases or experiences. They have found that a human expert is much more capable of recalling experiences than articulating internal rules. They suggest that the reason for this difference is that the human expert may not in fact be using rules in the first place. (2) As problems are presented to the system for which no specific case or rule can match exactly, the system can reason from more general similarities to compute up with an answer. This second level of reasoning should more closely resemble human problem solving behavior when people are confronted with novel situations. (3) A cornerstone to this method is automatic learning. The system's memory of experiences will be changed and augmented by each additional case that is presented. The system will remember the problems that it has encountered and use that information to solve

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SEARCH CONTROL NO. EVI19B

AD-A145 609

12/1

NORTH CAROLINA UNIV AT CHAPEL HILL CENTER FOR STOCHASTIC PROCESSES

(U) On the Rate of Mean Convergence of Finite Linear Predictors of Multivariate Stationary Stochastic Processes.

DESCRIPTIVE NOTE: Technical rept.,

JUL 84

23P

PERSONAL AUTHORS: Pourahmadi, M. ;

REPORT NO. TR-89

CONTRACT NO. F49620-82-C-0008

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR
TR-84-0825

UNCLASSIFIED REPORT

ABSTRACT: (U) This document considers a multivariate weakly stationary stochastic process $(X_{\text{sub } n})$ with the spectral density matrix f satisfying the boundedness condition. It is shown that if the entries of f are analytic functions of θ on $[-\pi, \pi]$, then the rate of convergence of the one-step ahead linear least squares predictor of $(X_{\text{sub } n})$ based on a finite segment of the past, and the partial sum of the infinite linear least squares predictor of the process to the Kolmogorov-Wiener predictor is at least exponential. (Author)

DESCRIPTORS: (U) *Stochastic processes, *Multivariate analysis, *Mathematical prediction, *Convergence, Mean, Linearity, Stationary, Matrices(Mathematics), Exponential functions, Rates, Analytic functions, Least squares method

IDENTIFIERS: (U) WJAFOSR2304A5, PE81102F

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AD-A145 608

12/1

17/2

MASSACHUSETTS INST OF TECH CAMBRIDGE LAB FOR INFORMATION AND DECISION SYSTEMS

(U) A Mathematical Theory of Command and Control Structures.

DESCRIPTIVE NOTE: Final rept. 1 Jul 83-30 Jun 84.

AUG 84

77P

PERSONAL AUTHORS: Levis, A. H. ;

REPORT NO. LIDS-FR-1393

CONTRACT NO. AFOSR-80-0229

PROJECT NO. 2304

TASK NO. A8

MONITOR: AFOSR
TR-84-0830

UNCLASSIFIED REPORT

ABSTRACT: (U) The elements of a mathematical theory for the analysis and design of organizations are presented. The focus of the research has been on information processing and decisionmakers organizations supported by Command Control and Communications(C3) systems. The mathematical framework used in modeling the individual decisionmakers, as well as the organization, is that of n-dimensional information theory. Petri Net representation of the organizational structure is used to model the interactions between organization members as well as their interactions with the C3 system. Comparison and evaluation of alternative organizational forms is accomplished by considering organizational performance, individual workload and the sets of satisfying decision strategies. A brief description of research on distributed estimation and on information storage and flow in C3 systems is also included.

DESCRIPTORS: (U) *Mathematics, *Theory, *Command and control systems, Information processing, Decision making, Information theory, Data storage systems, Organizations, Interactions, Air Force research, Tactical communications, Models, Preprocessing

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AD-A145 579 14/2

IDENTIFIERS: (U) C3(Command Control and Communications),
WUAFOSR2304, PE61102F

SOUTH CAROLINA UNIV COLUMBIA DEPT OF MATHEMATICS AND
STATISTICS

(U) On Discrete Failure Models.

DESCRIPTIVE NOTE: Technical rept..

JUL 84 21P

PERSONAL AUTHORS: Padgett, W. J. ; Spurrier, J. D. ;

REPORT NO. TR-97, 82N05-10

CONTRACT NO. AFOSR-84-0158

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR
TR-84-0887

UNCLASSIFIED REPORT

ABSTRACT: (U) In some situations, discrete failure time distributions are more appropriate to model lifetimes than continuous distributions. Very few results for the discrete case have been given in the literature. This paper provides three families of discrete parametric lifetime distribution which are quite versatile in fitting Increasing Failure Rate (IFR) and Decreasing Failure Rate (DFR), and constant failure rate models to either uncensored or right-censored life-test data. The maximum likelihood estimation (MLE) of parameters, survival probabilities, and mean lifetimes is investigated, and the MLEs are shown to be easily computed by simple numerical methods. An example is given for each of the models, allowing the comparison of the proposed models. The example illustrates that the discrete models presented can provide a better fit to discrete data than previously proposed discrete distributions.

DESCRIPTORS: (U) *Failure, *Mathematical models, Life tests

IDENTIFIERS: (U) *Discrete failure models, PE61102F,
WUAFOSR2304A5

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A145 570 9/3 12/1
NORTHEASTERN UNIV BOSTON MA

(U) Asynchronous Discrete Control of Continuous Processes.

DESCRIPTIVE NOTE: Annual rept. 1 Jul 83-30 Jun 84.

JUL 84 12P

PERSONAL AUTHORS: Kaliski, M. E.; Johnson, T. L. ;

CONTRACT NO. F49620-82-C-0080

PROJECT NO. 2304

TASK NO. A1

MONITOR: AFOSR
TR-84-0854

UNCLASSIFIED REPORT

ABSTRACT: (U) The research during this second contract year continued to deal with the development of sound theoretical models for asynchronous systems. Two criteria served to shape the research pursued: the first, that the developed models extend and generalize previously developed research for synchronous discrete control; the second, that the models explicitly address the question of how to incorporate system transition times into themselves. The following sections of this report concisely delineate this year's work. Our original proposal for this research identified four general tasks of investigation: (1.1) Analysis of Qualitative Properties of Asynchronous Hybrid Systems; (1.2) Acceptance and Control for Asynchronous Hybrid Systems.

DESCRIPTORS: (U) *Asynchronous systems, *Control theory, *Numerical methods and procedures, Continuous processing, Coding, Feedback, Hybrid systems, Stochastic control, Real time

IDENTIFIERS: (U) PE61102F, WUAFOSR2304A1

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AD-A145 569 12/1

SOUTH CAROLINA UNIV COLUMBIA DEPT OF MATHEMATICS AND STATISTICS

(U) Nonparametric Maximum Penalized Likelihood Estimation of a Density from Arbitrarily Right-Censored Observations.

DESCRIPTIVE NOTE: Technical rept.,

JUN 84 19P

PERSONAL AUTHORS: Lubecke, A. M.; Padgett, M. J. ;

REPORT NO. TR-98, 82G05-9

CONTRACT NO. AFOSR-84-0156

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR
TR-84-0888

UNCLASSIFIED REPORT

ABSTRACT: (U) Based on arbitrarily right-censored observations from a probability density function f deg. the existence and uniqueness of the maximum penalized likelihood estimator (MPLE) of f deg is proven. In particular, the first MPLE of Good and Gaskins of a density defined on $(0, \infty)$ is shown to exist and to be unique under arbitrary right-censorship. Furthermore, the MPLE is in the form of an exponential spline which knots at the observed censored and uncensored data points. (Author)

DESCRIPTORS: (U) *Nonparametric statistics, Probability density functions, Data bases, Theorems

IDENTIFIERS: (U) MPLE(Maximum Penalized Likelihood Estimation), Likelihood estimation, PE61102F, WUAFOSR2304A5

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DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. EVI198

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AD-A145 556 12/1

STANFORD UNIV CA DEPT OF COMPUTER SCIENCE

WASHINGTON STATE UNIV PULLMAN DEPT OF PURE AND APPLIED MATHEMATICS

(U) On Complementary and Independent Mappings on Databases.

DESCRIPTIVE NOTE: Technical rept..

(U) Rapidly Convergent Algorithms for Nonsmooth Optimization.

84 7P

DESCRIPTIVE NOTE: Interim scientific rept., 15 Jul 83-14 Jul 84,

PERSONAL AUTHORS: Keller, A. M.; Ullman, J. D.;

CONTRACT NO. AFOSR-80-0212, N00039-82-G-0250

PERSONAL AUTHORS: Mifflin, R.;

PROJECT NO. 2304

CONTRACT NO. AFOSR-83-0210

TASK NO. A7

PROJECT NO. 2304

MONITOR: AFOSR

TR-84-0708

TASK NO. A1

UNCLASSIFIED REPORT

MONITOR: AFOSR
TR-84-0727

ABSTRACT: (U) This document defines the notion of independent views to indicate whether the range values of the two views may be achieved independently. The concepts of complementary views indicates when the domain element can be uniquely determined by the range values of the two complementary views. The relationship between independent and complementary views is considered. In unrestricted domains, a view (but not the identify or empty view) can have more than one complementary, independent view. Databases, however, are more restricted domains: They are finite power sets. A view is monotonic if it preserves inclusion. However, in finite power sets when all views are monotonic, if a given view has another view which is independent and complementary, then this view is unique.

DESCRIPTORS: (U) *Mapping, *Monotone functions, *Data bases, Theory, Translators, Modification

IDENTIFIERS: (U) *Relational data bases, Power sets, PEG1102F, WJAFOSR2304A7

AD-A145 557

AD-A145 556

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UNCLASSIFIED REPORT

ABSTRACT: (U) This research has led to new developments for solving nonlinear optimization problems involving functions that are not everywhere differentiable and/or are implicitly defined. For the single variable case a method has been given which combined polyhedral and quadratic approximation, and automatic scale-free penalty technique and a safeguard that insures convergence to a stationary point, but does not detract from rapid convergence. Under relatively weak convergence rate assumptions the algorithm exhibits a new type of better than linear convergence. The safeguard also has the practical advantage of keeping apart points that are used in denominators of difference quotients for approximating second derivatives. A practical single resource allocation problem with several bounded decision variables has been solved very efficiently via a dual technique that used the single variable method in a nested manner to solve both the outer dual problem and the inner Lagrangian subproblems. The new concept of better than linear convergence form the single variable case has been generalized to the multivariable case. Author supplied key words also include: constrained minimization, and line search.

DESCRIPTORS: (U) *Optimization, *Convergence, Algorithms.

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI 198

AD-A145 556 CONTINUED

Nonlinear analysis

AD-A145 555 12/2

MASSACHUSETTS UNIV AMHERST DEPT OF MATHEMATICS AND
STATISTICS

IDENTIFIERS: (U) PE81102F, WJAFOSR2304A1

(U) Applications of Functional Analytic and Martingale
Methods.

DESCRIPTIVE NOTE: Annual scientific rept. 15 May 83-14
May 84,

JUL 84 4P

PERSONAL AUTHORS: Rosenkrantz, W. A. ;

CONTRACT NO. AFOSR-82-0187

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR
TR-84-0718

UNCLASSIFIED REPORT

ABSTRACT: (U) This annual report surveys and summarizes
the principal investigator's current research on modeling
and analysis of various random access protocols via
Martingale and functional analytical methods. (Author)

DESCRIPTORS: (U) *Queueing theory, Stochastic processes,
Problem solving, Random variables, Functional analysis,
Research management

IDENTIFIERS: (U) Martingales, PE81102F, WJAFOSR2304A5

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EV1198

AD-A145 554 12/1 9/2

AD-A145 525 20/11 12/1 22/2

NORTH CAROLINA UNIV AT CHARLOTTE DEPT OF MATHEMATICS

STATE UNIV OF NEW YORK AT BUFFALO AMHERST DEPT OF
MECHANICAL AND AEROSPACE ENGINEERING

(U) Life Distribution Properties of Devices Subject to
Deterioration. Research Progress.

(U) Qualitative Results for Distributed Systems with
Discrete Damping and Stiffness with Application to
Control.

DESCRIPTIVE NOTE: Interim scientific rept. 1 Jul 83-30
Jun 84.

DESCRIPTIVE NOTE: Interim rept. 1 Jul 83-30 Jun 84.

JUL 84 13P

JUL 84 9P

PERSONAL AUTHORS: Abdel-Hameed, M. ;

PERSONAL AUTHORS: Inman, D. J. ;

CONTRACT NO. AFOSR-80-0245

CONTRACT NO. AFOSR-82-0242

PROJECT NO. 2304

PROJECT NO. 2304

TASK NO. A5

TASK NO. A1

MONITOR: AFOSR
TR-84-0725

MONITOR: AFOSR
TR-84-0724

UNCLASSIFIED REPORT

ABSTRACT: (U) Research during this period concentrated
on the following areas: (1) life distribution properties
of devices subject to a pure jump damage process; (2) a
power transformation exponential regression model for
censored failure time data; (3) stability of optimal
replacement problems; (4) an iterative scheme for
approximating optimal replacement policies; and (5)
stability of optimal stopping problems. This report
summarizes progress in these areas. (Author)

DESCRIPTORS: (U) *Research management, *Mathematics,
*Computers, Mathematical models, Distribution functions,
Exponential functions, Regression analysis, Optimization,
Replacement, Stability, Iterations

IDENTIFIERS: (U) Life distribution properties. PE61102F.
WJAFOSR2304A5

AD-A145 554

AD-A145 525

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UNCLASSIFIED REPORT

ABSTRACT: (U) Distributed parameter models of large
flexible space structures subject to various control
techniques have been studied. The main thrust has been to
develop qualitative results which are independent of
truncation or discretization approaches by treating the
fully distributed model. Emphasis has been on controlling
the transient response of non-conservative linear partial
differential equation models of such structures subject
to a few point actuators. (Author)

DESCRIPTORS: (U) *Vibration, *Damping, *Aerospace
systems, *Partial differential equations, Parametric
analysis, Distribution, Feedback, Linear systems,
Convergence, Flexible structures, Stability, Qualitative
analysis

IDENTIFIERS: (U) WJAFOSR2304A1, PE61102F

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OTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. EVI198

AD-A145 508 20/12 11/8

AD-A145 505 12/1

PARIS-8 UNIV (FRANCE) LABORATOIRE D'OPTIQUE DES SOLIDES

FLORIDA STATE UNIV TALLAHASSEE DEPT OF STATISTICS

(U) Relationships between Electronic Structure and Stability of Metallic Glasses.

(U) Computing the Reliability of k out of n Systems.

DESCRIPTIVE NOTE: Technical rept..

DESCRIPTIVE NOTE: Final scientific rept. 1 Jan-31 Dec 83.

OCT 83 14P

JUN 84 41P

PERSONAL AUTHORS: Abeles, F.; Theye, M. L.; Nguyen Van, V.;

PERSONAL AUTHORS: Boland, P. J.; Proschan, F.;

CONTRACT NO. AFOSR-83-0080

CONTRACT NO. F49620-82-K-0007

PROJECT NO. 2308

PROJECT NO. 2304

TASK NO. C3

TASK NO. A5

MONITOR: AFOSR

MONITOR: AFOSR

TR-84-0705

TR-84-0715

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) Amorphous MgZn alloys have been obtained in the form of thin films by co-evaporation under ultra-high vacuum on cold sapphire substrates (\approx approx. 10K), for Zn concentrations between 25 and 35 at.%. These films crystallize at about 350K. Their d.c. electrical resistivity and their optical properties between 0.8 and 4 eV have been investigated in situ. The resistivity versus temperature behaviour is roughly similar to that reported for quenched bulk alloys but the resistivity values are significantly larger. The complex dielectric constant follows the free-electron Drude model at low energies up to 1.8 eV. The optical free electron parameters are discussed and compared to those obtained on other free-electron-like amorphous alloys. Special attention is paid to the average effective number of conduction electrons per atom, which is found to be smaller than expected. (Author)

ABSTRACT: (U) This document surveys some of the more important theoretical results about the structure of the reliability function of a k out of n system, and indicates how these results may be used to obtain easily calculable bounds for the reliability of a specified k out of n system. (Author)

DESCRIPTORS: (U) *Statistical functions, Systems analysis, Reliability, Theorems

IDENTIFIERS: (U) Reliability functions, WUAFOSR2304A5, PE61102F

DESCRIPTORS: (U) Electrons, Magnesium alloys, Zinc alloys, Amorphous materials, Electrical properties, Metal films, Thin films, Electrical resistance

IDENTIFIERS: (U) *Electronic structure, PE61102F, WUAFOSR2308C3

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SEARCH CONTROL NO. EVI198

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AD-A145 488 12/1

CALIFORNIA UNIV BERKELEY OPERATIONS RESEARCH CENTER

NORTH CAROLINA UNIV AT CHAPEL HILL CENTER FOR STOCHASTIC PROCESSES

(U) Interim Scientific Report, Grant AFOSR-81-0122, 1 June 1983 - 31 May 1984,

(U) Limit Theory for the Sample Covariance and Correlation Functions of Moving Averages.

JUL 84 11P

DESCRIPTIVE NOTE: Technical rept..

PERSONAL AUTHORS: Barlow, R. E. ;

JUL 84 38P

CONTRACT NO. AFOSR-81-0122

PERSONAL AUTHORS: Davis, R. ; Resnick, S. ;

REPORT NO. TR-88

PROJECT NO. 2304

TASK NO. A5

CONTRACT NO. F49620-82-C-0009, NSF-DMS82-02335

MONITOR: AFOSR

PROJECT NO. 2304

TR-84-0728

UNCLASSIFIED REPORT

TASK NO. A5

ABSTRACT: (U) The report summarizes research during this period supported by the grant. Topics covered include system reliability, determining sample size for life test experiments, data extractions procedures, and acceptance sampling procedures. Abstracts of papers written during this period are included. (Author)

DESCRIPTORS: (U) *Research management, *Abstracts, Systems management, Reliability, Sampling, Life tests, Data management, Air Force research, Grants

IDENTIFIERS: (U) PE61102F, WUAFOSR2304A5

MONITOR: AFOSR
TR-84-0745

UNCLASSIFIED REPORT

ABSTRACT: (U) Document describes a moving average process which have regularly varying tail probabilities with index $\alpha > 0$. The limit distribution of the sample covariance function is derived in the case that the process has a finite variance but an infinite variance but an infinite fourth moment. Furthermore, in the infinite variance case ($0 < \alpha < 2$), the sample correlation function is shown to converge in distribution to the ratio of two independent stable random variables with indices α and $\alpha/2$, respectively. This result immediately gives the limit distribution for the least squares estimates of the parameters in an autoregressive process. (Author)

DESCRIPTORS: (U) *Functions(Mathematics), *Covariance, *Correlation techniques, Convergence, Random variables, Least squares method, Estimates, Parameters, Regression analysis, Variations, Stochastic processes

IDENTIFIERS: (U) Moving averages, PE61102F, WUAFOSR2304A5

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A145 484 CONTINUED

AD-A145 484 8/20 8/5

OHIO STATE UNIV RESEARCH FOUNDATION COLUMBUS

(U) Molecular Interactions of High Energy Fuels and Jet Fuels with Oncogenic Viruses and Endogenous Viruses.

IDENTIFIERS: (U) PE61102F, WUAFOSR2312A5, LPN-OSURF-762179-712882

DESCRIPTIVE NOTE: Final rept. 1 Jul 80-30 Sep 83.

MAY 84 147P

PERSONAL AUTHORS: Blakeslee, J. R., Jr.

CONTRACT NO. F49620-80-C-0087

PROJECT NO. 2312

TASK NO. A5

MONITOR: AFOSR
TR-84-0720

UNCLASSIFIED REPORT

ABSTRACT: (U) The objectives of this research were to develop rapid in-vitro assays, to evaluate the carcinogenic potential of chemicals used by the U.S. Air Force. Snyder-Theilen Feline Sarcoma Virus (ST-FeSV), quantitatively transforms human skin fibroblasts following second order kinetics. These studies were performed in order to determine whether chemicals altered ST-FeSV transformation in a predictable manner and to correlate the alteration with the carcinogenic or non-carcinogenic activity of the test chemical. The results, to date, show diverse carcinogens classed as: aromatic amines, polycyclic hydrocarbons, aminofluorenes, hydrazines, asbestos and mycotoxins inhibited virus transformation when virus infected cells (2 hours post-infection) were exposed to test chemical, while non-carcinogenic chemicals had no significant effect on transformation. Triton X-100, acetone, petroleum and shale oil derived JP5, RUS and diesel fuel, marine, demonstrated non-carcinogenic activity while formalin demonstrated carcinogenic activity. Experiments designed to show the specificity of the antagonistic effect of known carcinogens are reported.

DESCRIPTORS: (U) *Carcinogens, *Fuels, *Jet engine fuels, *Viruses, *Oncogenic viruses, *Bioassay, Molecules, Interactions, Chemicals, Fibroblasts, Skin(Anatomy), Humans, Organic compounds, Dosage, Tables(Data)

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A145 475 20/5

AD-A145 448 20/4 12/1

CALIFORNIA UNIV SANTA BARBARA QUANTUM INST

GEORGIA INST OF TECH ATLANTA SCHOOL OF CHEMICAL
ENGINEERING(U) Summary Discussion: Theoretical Aspects of XUV Free
Electron Lasers.

DESCRIPTIVE NOTE: Technical rept..

DEC 83 7P

PERSONAL AUTHORS: Colson, W. B. ; Becker, W. ; Benson, S. ;
Bhowmik, A. ; Cover, R. ;

CONTRACT NO. F49820-83-C-0043, N00014-81-K-0809

PROJECT NO. 2301

TASK NO. A1

MONITOR: AFOSR
TR-84-0734

UNCLASSIFIED REPORT

ABSTRACT: (U) We briefly summarize the existing knowledge on XUV operation of Free-Electron Lasers. The standard classical analysis is valid until about 1 Angstrom wavelength if a high energy electron beam is used. If a low energy beam is used, the limiting wavelength is larger. Other topics discussed are electron shot noise, photon statistics, photon and electron quantum effects, coherence, high-gain collective effects, higher harmonics, and transverse optical effects. (Author)

DESCRIPTORS: (U) *Free electrons, *Lasers, Frequency, Limitations, Ultraviolet radiation, Electron beams, High energy, High gain

IDENTIFIERS: (U) *Free electron lasers

AD-A145 475

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(U) Effect of the Basset Term on Particle Relaxation
Behind Normal Shock Waves.

DESCRIPTIVE NOTE: Final rept. 15 Mar 83-15 May 84,

JUL 84 72P

PERSONAL AUTHORS: Forney, L. J. ; Walker, A. E. ; McGregor, W.
K. ;

CONTRACT NO. AFOSR-83-0182

PROJECT NO. 2307

TASK NO. D9

MONITOR: AFOSR
TR-84-0747

UNCLASSIFIED REPORT

ABSTRACT: (U) Small particles and droplets encounter normal shocks in a variety of applications. The particle-shock interaction subjects the particles to large unsteady drag forces behind the shock front. In this paper, an analysis has been made of the relative importance of the Basset history integral for particle displacement and velocity behind a normal shock wave. The effect of the Basset integral has been related to gas stagnation conditions and the local gas Mach number. In the present theoretical study it has been demonstrated that the particle velocity and displacement relative to the gas back of the shock is unaffected by the inclusion of the Basset term until the latter stages of particle relaxation. The effect of the Basset history integral, which results from diffusion of vorticity from the decelerating particle, has been shown to decrease the particle drag or increase the displacement of the particle back of the shock. The effect is magnified with increasing stagnation pressures and particle diameters but with decreasing gas stagnation temperatures.

DESCRIPTORS: (U) *Aerodynamic drag, *Shock waves, *Particle flux, *Numerical analysis, Displacement, Nozzle gas flow, Stagnation pressure, Mach number, Particle size, Relaxation, Unsteady flow

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A145 446 CONTINUED

AD-A145 445 8/18

VIRGINIA MASON RESEARCH CENTER SEATTLE WA

IDENTIFIERS: (U) *Basset Integral, WJAFOSR230709,
PE61102F

(U) Interaction of Anti-G Measures and Chest Wall
Mechanics in Determining Gas Exchange.

DESCRIPTIVE NOTE: Final rept. 1 Apr 81-31 Mar 84,

JUN 83 92P

PERSONAL AUTHORS: Modell, H. I. ;

CONTRACT NO. F49620-81-C-0055

PROJECT NO. 2312

TASK NO. A1

MONITOR: AFOSR
TR-84-0751

UNCLASSIFIED REPORT

ABSTRACT: (U) This project represents an extension of an earlier project designed to examine factors influencing gas exchange during acceleration stress. Included in this report are studies dealing with the influence of the chest wall on regional intrapleural pressure during +Gz stress; influence of G-suit abdominal bladder inflation on gas exchange during +Gz stress; influence of the chest wall on gas exchange during mechanical ventilation; characterization of in vivo pressure-volume relationships of the pig's respiratory system; and mechanics of the pulmonary vasculature. Results indicate that the chest wall plays a significant role in determining gas exchange parameters during +Gz stress, during application of +Gz protective measures and during mechanical ventilation. (Author)

DESCRIPTORS: (U) *Thorax, *Gas exchange (Biology), *Acceleration, Stresses, Mechanics, Respiratory system, Walls, G suits

IDENTIFIERS: (U) WJAFOSR2312A1, PE611026

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A145 444 8/18

AD-A145 437 20/7

HARVARD MEDICAL SCHOOL BOSTON MA DEPT OF PHYSIOLOGY AND BIOPHYSICS

STEVENS INST OF TECH HOBOKEN N J

(U) Jet Lag Prevention: Physiological Mechanisms and Pharmacological Therapy.

(U) Surface Production of Negative Hydrogen Ions.

DESCRIPTIVE NOTE: Final scientific rept. 1 Apr 78-31 Mar 83.

DESCRIPTIVE NOTE: Annual scientific rept. 1 Jun 83-31 May 84.

MAR 84 17P

JUN 84 29P

PERSONAL AUTHORS: Seidl, M. ;

PERSONAL AUTHORS: Moore-Ede, M. C. ;

CONTRACT NO. AFOSR-83-0230

CONTRACT NO. AFOSR-78-3560

PROJECT NO. 2312

PROJECT NO. 2301

TASK NO. A1

TASK NO. A7

MONITOR: AFOSR
TR-84-0752

MONITOR: AFOSR
TR-84-0739

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

Availability: Document partially illegible.

ABSTRACT: (U) This research program was concerned with the physiological mechanisms that underlie the phenomenon of jet-lag and was aimed at developing therapeutic techniques to minimize the performance and physiological deficits that occur in rapid transmeridian air travel. During the course of this project, the circadian pacemaker responsible for the timing of the daily rest-activity was identified in the brain of the diurnal primate, the squirrel monkey (*Saimiri sciureus*). The suprachiasmatic nuclei were also identified in the human brain. A number of other significant advances included: developing a model of the circadian sleep-wake cycle, characterizing how phase shifts of the light-dark cycle reset the timing of the sleep-wake cycle, and identifying pharmacological agents which can phase-reset the circadian system.

DESCRIPTORS: (U) *Brain, Circadian rhythms, Travel, Jet aircraft, Physiology, Adaptation(Physiology)

IDENTIFIERS: (U) *Jet lag, Sleep wake cycle

AD-A145 444

AD-A145 437

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ABSTRACT: (U) Production of negative hydrogen ions by sputtering adsorbed hydrogen from a molybdenum surface bombarded with cesium ions has been investigated. The negative hydrogen yield (number of negative hydrogen ions sputtered per incident cesium ion) is largest when the workfunction of the surface is minimized by appropriate cesium coverage. The yield has a maximum value of 0.5 at cesium ion energy of 750 eV and approaches zero at 150 eV cesium energy. The angular distribution of the hydrogen ions is close to a gaussian distribution with a standard deviation of 3 degrees, approximately independent of the bombarding energy. This means that the negative hydrogen ions have a Maxwellian distribution in parallel energies with a temperature between 0.3 to 0.5 percent of the bombarding energy.

DESCRIPTORS: (U) *Hydrogen, *Anions, Production, Sputtering, Ion sources, Impact, Emission, Ion bombardment, Cesium, Molybdenum

IDENTIFIERS: (U) WJAFOSR2301A7, PEB1102F

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A145 430 20/8 12/1

AD-A145 424 9/2

CALIFORNIA UNIV SANTA BARBARA

MARYLAND UNIV COLLEGE PARK CENTER FOR AUTOMATION RESEARCH

(U) Spontaneous Radiation from Relativistic Electrons in a Taper Undulator.

(U) Parallel Searching and Merging on ZM08.

DESCRIPTIVE NOTE: Technical rept..

DESCRIPTIVE NOTE: Technical rept..

JUN 83 12P

JUN 84 41P

PERSONAL AUTHORS: Bosco, P. ; Colson, W. B. ;

PERSONAL AUTHORS: Kasif, S. ;

CONTRACT NO. F49620-83-C-0043

REPORT NO. CAR-TR-84, CSC-TR-1405

PROJECT NO. 2301

CONTRACT NO. F49620-83-C-0082

TASK NO. A1

PROJECT NO. 2304

MONITOR: AFOSR
TR-84-0736

TASK NO. A2

MONITOR: AFOSR
TR-84-0746

UNCLASSIFIED REPORT

ABSTRACT: (U) The spectrum, angular distribution, polarization and coherence properties of the radiation emitted by relativistic electrons undulating through a quasiperiodic tapered magnetic field are studied. Tapering the wavelength and/or field strength along the undulator's axis has the effect of spreading the spectral line to higher frequencies; interference over this broader spectral range results in a more complex line shape. The angular dependence, on the other hand, is not affected by the amount of taper. The polarization of the radiation in the forward direction is determined by the transverse polarization of the undulator, but the polarization changes off axis. The radiation patterns predicted here are distinct from those of untapered undulators, and their detection is now feasible. They will provide useful diagnostics of electron trajectories and threshold behavior in free-electron-laser oscillators using tapered undulators. (Author)

DESCRIPTORS: (U) *Electron emission, *Radiation patterns, *Equations, Magnetic fields, Taper, Electromagnetism, Bremsstrahlung, Trajectories, Polarization, Coherence, Predictions, Oscillators, Harmonics, Air Force personnel

IDENTIFIERS: (U) Free electron lasers, *Taper undulators, *Undulators, Relativistic electrons, NUAFOSR2301A1, PE61102F

AD-A145 430

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UNCLASSIFIED REPORT

ABSTRACT: (U) One of the most difficult issues that must be addressed when studying a class of parallel algorithms is the problem of choosing a model that captures the inherent difficulty of implementing these algorithms on a multiprocessor architecture. Shared memory models have proven to be an effective tool for deriving lower bounds on the complexity of comparison problems. In particular, a speed-up of $lg(P)$ is possible for the problem of finding an element in an N -element sorted list, and speed-ups of $P^{1/2}$ and P are possible for merging N -element sorted lists of P processors for the cases $N=P$ and $P < N$ respectively. In practice, these speed-ups are not attainable since the shared memory models ignore many practical considerations in multiprocessor systems, such as interprocessor communications, distribution of data on local memories and limited fan-out of memory locations. In this paper we introduce a model for parallel computation that is strictly weaker than the shared memory models. The model is based on an actual machine currently being constructed (ZM08). We examine the communication facilities available in the model and show that lower bounds for merging and searching on shared memory models are attainable (within a constant).

DESCRIPTORS: (U) *Memory devices, *Parallel processing.

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A145 424 CONTINUED

Algorithms, Multiprocessors, Searching, Computer architecture

IDENTIFIERS: (U) WJAFOSR2304A2, PE61102F

AD-A145 423 20/5 20/7

CALIFORNIA UNIV SANTA BARBARA

(U) Long Pulses and Sideband Instability in Free Electron Laser Oscillators.

DESCRIPTIVE NOTE: Technica; rept.,

83 2P

PERSONAL AUTHORS: Freedman, R. A. ; Colson, W. B. ;

CONTRACT NO. F49620-83-C-0043, AFOSR-81-0061

PROJECT NO. 2301

TASK NO. A1

MONITOR: AFOSR
TR-84-0738

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SUPPLEMENTARY NOTE: Pub. in Bender Free Electron Laser Conference, J. de Physique, v44 nC1-xx p1-2 1983.

Reprint: Long Pulses and Sideband Instability in Free Electron Laser Oscillators.

DESCRIPTORS: (U) *Lasers, *Electron beams, Nonlinear systems, Optics, Reprints

IDENTIFIERS: (U) Optical modes, FEL(Free Electron Lasers) , Undulators, Slippage distance, WJAFOSR2301A1, PE61102F

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AD-A145 423

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DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. EVI198

AD-A145 412 5/10

AD-A145 405 8/15 8/19

OREGON UNIV EUGENE

BEN-GURION UNIV OF THE NEGEV BEERSHEBA (ISRAEL)

(U) Visual Representations Subserviving Texture Perception.

(U) Effect of Exercise and Environmental Heat on Drug Kinetics.

DESCRIPTIVE NOTE: Annual rept. no. 1, 30 Apr 83-1 May 84.

DESCRIPTIVE NOTE: Final scientific rept. 1 Feb 82-31 Jan 84.

MAY 84 15P

PERSONAL AUTHORS: Beck, J. ; Stevens, K. A. ;

JUN 84 21P

CONTRACT NO. F49620-83-C-0093

PERSONAL AUTHORS: Danon, A. ;

PROJECT NO. 2313

CONTRACT NO. AFOSR-82-0090

TASK NO. A5

PROJECT NO. 2312

MONITOR: AFOSR

TASK NO. AI

TR-84-0753

MONITOR: AFOSR

TR-84-0754

UNCLASSIFIED REPORT

ABSTRACT: (U) The ongoing research investigates the representations of visual texture and the processes that detect discontinuities and structure in visual texture. Psychophysical experiments have investigated the salience of bar orientation and the effect of groupings in texture segmentation. We are examining the role of elongated receptive field mechanisms in computing both local measures of orientation and their possible role in texture segmentation. We have found such mechanisms, however, to be less appropriate for determining one-dimensional groupings of (collinear) discrete items of texture. Combined psychophysical and computational studies have provided evidence for place tokens in groupings, and current work is directed towards understanding how these tokens may be defined in fine-scale texture detail. To support this work, a vision laboratory has been established based on a Symbolics 3600 Lisp Machine. (Author)

DESCRIPTORS: (U) *Visual perception, *Texture, Psychophysics, Orientation(Direction), Discrimination, Test methods, Discontinuities, Detection, Optical detection

IDENTIFIERS: (U) *Visual texture, Symbolics 3600 LISP machine, WUAFOSR2313AS, PEG1102F

AD-A145 412

AD-A145 405

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UNCLASSIFIED REPORT

ABSTRACT: (U) The effects of physical exercise and heat exposure on the pharmacokinetic behavior of some model drugs were investigated in normal volunteers. Drugs were chosen to represent particular kinetic processes. Exercise was mild to moderate and environmental temperature was either 22 C or 40 C. Under heat exposure and exercise, theophylline exhibited prolonged half-life and reduced clearance, suggesting the need for dosage adjustment in moderately active individuals. Exercise influenced digoxin kinetics by shortening the time to peak, probably by enhancing the drug's absorption. The plasma kinetics of quinidine were unchanged under exercise conditions. However, urinary excretion of the drug was significantly higher during exercise than at rest, and this correlated with increased urinary output during exercise. Exercise and heat exposure prolonged the time of distribution of intravenously administered propranolol, while other pharmacokinetic parameters relating to propranolol remained unchanged. The half lives (T1/2) of both sulfamethoxazole and trimethoprim that were administered as co-trimoxazole were not significantly altered. The absorption of methylsalicylate that was applied on the skin was markedly influenced by the conditions tested. Thus, the amount of salicylate that was absorbed increased three fold while the subjects were exposed to either heat or exercise or both.

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A145 405 CONTINUED

AD-A145 400 20/5 12/1

CALIFORNIA UNIV SANTA BARBARA

DESCRIPTORS: (U) *Pharmacokinetics, *Drugs,
*Exercise(Physiology), Heat, Exposure(Physiology)

(U) Synchrotron Instability for Long Pulses in Free
Electron Laser Oscillators.

IDENTIFIERS: (U) Theophyllin, Digoxin, Quinidine,
Propranolol, Methylsalicylate, Trimoxazole, PE81102F,
WUAFOSR2312AI

DESCRIPTIVE NOTE: Technical rept.,

83 8P

PERSONAL AUTHORS: Colson, W. B. ; Freedman, R. ;

CONTRACT NO. F49620-83-C-0043

PROJECT NO. 2301

TASK NO. A1

MONITOR: AFOSR
TR-84-0735

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Optics Communications, v48
n37 p1-13 1983.

Reprint: Synchrotron Instability for Long Pulses in Free
Electron Laser Oscillators.

DESCRIPTORS: (U) *Oscillators, *Laser applications,
Light pulses, Equations, Optics, Synchrotrons, Air Force
research, Reprints

IDENTIFIERS: (U) Free electron lasers, PE81102F,
WUAFOSR2301A1

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AD-A145 396

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UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES DEPT OF
MATHEMATICS

OHIO STATE UNIV RESEARCH FOUNDATION COLUMBUS

(U) Inverse Problems, Optimization and Algorithms.

(U) Benzamide Derivatives as Protective Agents against the
Action of Xenotoxic Agents on Human Cells.

DESCRIPTIVE NOTE: Final scientific rept. 1 Jul 80-30 Jun
83,

DESCRIPTIVE NOTE: Annual rept. 1 Jan-31 Dec 83,

JUL 84 9P

MAY 84 64P

PERSONAL AUTHORS: Milstein, J. ;

PERSONAL AUTHORS: Milto, G. E. ;

CONTRACT NO. AFOSR-80-0243

CONTRACT NO. AFOSR-83-0042

PROJECT NO. 2304

PROJECT NO. 2312

TASK NO. A3

TASK NO. A5

MONITOR: AFOSR

MONITOR: AFOSR

TR-84-0743

TR-84-0758

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) Research completed includes the following:
The dynamics of a system nonlinear ordinary differential
equation depends on the constant coefficients (parameters)
of the system. Identifying these coefficients from the
solution curves defines an inverse problems. A method to
determine the values of the parameters from a finite
number of solution curves was developed and implemented.
The method consist of two major algorithmic procedures (1)
A derivative free nonlinear optimization, (2) An error
analysis of the parameters found.

DESCRIPTORS: (U) *Nonlinear differential equations,
Algorithms, Coefficients, Error analysis, Optimization

IDENTIFIERS: (U) Inverse problem, PE61102F

ABSTRACT: (U) In addition to finding that benzamide can
intervene in carcinogen induced neoplastic transformation
that is cell cycle dependent, we also developed a
procedure for detecting the presence of a malignant
phenotype in sarcoma tumor tissue. Monoclonal antibodies
(McAb) were developed against the transformed phenotype
that cross reacted with the chemically transformed cells.
We were able also to use this McAb for the detection of
sarcomatous invasive lesions in human tissue in the
presence of normal stroma. Using these procedures
described above combined with the analysis of competitive
inhibitory kinetics of poly(ADP-ribose) polymerase
activity we have now been able to identify eleven of
these inhibitors that interfere in the neoplastic
transformation process, (to be published in 1984-85).
During this time period we were also able to establish
human skin xenografts on nude mice and apply these
technologies to human skin in vivo situations. We have
also introduced a new technology for examining
modification of DNA by the carcinogen, i.e. post labeling
of the modified DNA that only requires 2 x 10 to the 6th
power cells and ca. 190-200 ng of DNA.

DESCRIPTORS: (U) *Neoplasms, *Carcinogens, Inhibition,
Transformations, Interactions, Deoxyribonucleic acids,
Tissue culture, Fibroblasts, Detection, Humans,
Skin(Anatomy)

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SANDIA NATIONAL LABS ALBUQUERQUE NM

IDENTIFIERS: (U) *Benzamide, *Xenotoxic agents,
Phenotype, Xenografts, LPN-OSURF-763409/715067,
WUAFOSR2312A5, PEB1102F

(U) IEEE Pulsed Power Conference (4th) Held at Albuquerque,
New Mexico on 6-8 June 1983.

DESCRIPTIVE NOTE: Final rept.,

JUN 83 858P

PERSONAL AUTHORS: Rose, M. F.; Martin, T. H.;

CONTRACT NO. AFOSR-ISSA-83-00048

PROJECT NO. 2301

TASK NO. A7

MONITOR: AFOSR
TR-84-0692

UNCLASSIFIED REPORT

ABSTRACT: (U) Continuing its expansive growth, nearly 600 participants attended the 5th IEEE Pulsed Power Conference with 38 individuals from nine foreign countries - Canada, England, France, Israel, Japan, West Germany, Italy, Switzerland, and Denmark. The number of technical contributions was 220 resulting, for the first time, in a conference with four parallel sessions. In addition to the many fine comments on the technical content of the meeting, we received ample praise for the accommodations, special events and general excellence of the facilities at the Albuquerque Convention Center. It is with reluctance that we leave these facilities for the 1983 conference. The Executive Committee voted to hold the 5th IEEE Pulsed Power Conference in the Washington, D. C. area on June 10, 11, and 12, 1985. Frank Rose of the Naval Surface Weapons Center was elected as Conference Chairman with Peter Turchi, R and D Associates, as the Technical Program Committee Chairman.

DESCRIPTORS: (U) *Pulse generators, *Energy conversion, *Power supplies, *Symposia, Switching circuits, Pulse rate, Breakdown(Electronic threshold), Plasmas(Physics), Electric fuzes(Ordnance), Thyristors, Power, Spark gaps, Vacuum apparatus, Modulators, Dielectrics, Triodes, Explosives, Gases, Diodes, Pulses, New Mexico

IDENTIFIERS: (U) Capacitor banks, Homopolar generators,

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Magnetic switches, Stores(Inductive), Rotating machines,
Energy storage, WJAFOSR2301A7, PE61102F

WISCONSIN UNIV-MADISON DEPT OF COMPUTER SCIENCES

(U) Annual Report, Air Force Grant AFOSR-82-0275.

DESCRIPTIVE NOTE: Interim rept, 15 Jun 83-14 Jun 84,

JUL 84 5P

PERSONAL AUTHORS: Parter, S. V. ;

CONTRACT NO. AFOSR-82-0275

PROJECT NO. 2304

TASK NO. A3

MONITOR: AFOSR
TR-84-0723

UNCLASSIFIED REPORT

ABSTRACT: (U) The research project emphasized solving
Elliptic-Parabolic Problems. Topics of special interest
were: The extension of the basic theory of classical
iterative methods; and The study of multigrid methods.
This report summarizes progress in these areas to date.
(Author)

DESCRIPTORS: (U) *Iterations, *Grids, Problem solving,
Air Force research, Ellipses, parabolas

IDENTIFIERS: (U) *Multigrids, PE61102F, WJAFOSR2304A3

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DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. EV119B

AD-A145 236

12/1

NORTH CAROLINA UNIV AT CHAPEL HILL DEPT OF STATISTICS

(U) Comment.

JUN 84 4P

PERSONAL AUTHORS: Carroll, R. J. ; Ruppert, D. ;

CONTRACT NO. F49620-82-C-0008, NSF-WCS81-00748

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR
TR-84-0730

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of the American
Statistical Association, v79 n386 p312-313 Jun 84.

Reprint: Comment.

DESCRIPTORS: (U) *Transformations(Mathematics),
*Statistical Inference, Models, Data processing, Reprints

IDENTIFIERS: (U) Power transformation, PE81102F,
WUAFOSR2304A5

AD-A145 219 12/1 20/4 1/3

MASSACHUSETTS INST OF TECH CAMBRIDGE COMPUTATIONAL FLUID
DYNAMICS LAB

(U) Computational Methods for Complex Flowfields.

DESCRIPTIVE NOTE: Annual rept. 1 Jun 83-31 May 84,

JUN 84 67P

PERSONAL AUTHORS: Murman, E. M. ; Baron, J. R. ;

CONTRACT NO. AFOSR-82-0136

PROJECT NO. 2307

TASK NO. A1

MONITOR: AFOSR
TR-84-0755

UNCLASSIFIED REPORT

ABSTRACT: (U) The development of solution algorithms for
complex flowfields is the continuing objective of the
research. Major focus is on use of coupled subdomains and
descriptions which are either preselected or adapted to
fit the physical events when necessary. The non-adaptive
embedded mesh algorithm has completed airfoil solutions
with an allowance for highly stretched meshes, alternate
grids and reducing smoothing. A new algorithm is
combining features from cell and nodal-centered methods
to permit general embedded topology. Adaptive embedded
mesh procedures have been extended to and carried out for
two-dimensional Euler, subsonic, transonic and supersonic
flows. An optimal distribution of local Courant numbers
has been considered as a basis for accelerating the
solution approach to a steady state. (Author)

DESCRIPTORS: (U) *Numerical methods and procedures,
*Algorithms, *Flow fields, *Computations, Airfoils,
Subsonic characteristics, Transonic characteristics,
Supersonic characteristics, Grids(Coordinates), Embedding,
Adaptive systems, Fluid dynamics

IDENTIFIERS: (U) Euler equations, WUAFOSR2307A1,
PE81102F

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A145 213 12/1 13/8 15/5
 PENNSYLVANIA STATE UNIV UNIVERSITY PARK DEPT OF
 INDUSTRIAL AND MANAGEMENT SYSTEMS ENGINEERING
 (U) Development of a Production Order Release Methodology.

DESCRIPTIVE NOTE: Final rept. 1 Sep 83-31 May 84,

JUL 84 34P

PERSONAL AUTHORS: Medeiros, D. J. ;

CONTRACT NO. AFOSR-83-0333

PROJECT NO. 2304

TASK NO. D9

MONITOR: AFOSR
 TR-84-0728

UNCLASSIFIED REPORT

ABSTRACT: (U) The order release problem involves selecting subsets of available orders to release to the shop floor such that the system is utilized efficiently and queue time is reduced. A solution to this problem is proposed which combines Leontief flow models and linear programming in an iterative procedure. Examples of the approach are illustrated. (Author)

DESCRIPTORS: (U) *Mathematical models, *Management planning and control, *Production models, *Inventory control, Problem solving, Linear programming, Aircraft industry, Iterations, Routing, Efficiency, Assembly, Shops(Work areas), Queueing theory, Methodology

IDENTIFIERS: (U) Leontief flow models, Flow models, WUAFOSR2304D9, PE61102F

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AD-A145 211 5/10 5/9

OKLAHOMA UNIV NORMAN SCHOOL OF INDUSTRIAL ENGINEERING
 (U) Workload Demand and CNS Depressant Stressor Effects on Spatial Orientation Information Processing.

DESCRIPTIVE NOTE: Final scientific rept. 1 Apr 83-31 Mar 84,

JUL 84 77P

PERSONAL AUTHORS: Schlegel, R. E. ;

CONTRACT NO. AFOSR-83-0181

PROJECT NO. 2313

TASK NO. D9

MONITOR: AFOSR
 TR-84-0758

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Prepared in cooperation with Southeastern Center for Electrical Engineering Education, St. Cloud, FL, Contract F49620-82-C-0035.

ABSTRACT: (U) An important element of piloting high-performance jet aircraft is the human ability to perform spatial orientation information processing, particularly when it involves the use of video display instrumentation. Spatial disorientation has consistently been the cause of numerous accidents throughout the history of flight. A study was conducted to further evaluate the Manikin Task, a complex reaction time task previously developed by the RAF as a test of spatial orientation. The objectives of the study were to (1) thoroughly evaluate the training characteristics of the task including variation in performance related to individual stimuli characteristics, (2) determine the task's speed vs. accuracy tradeoff characteristics, and (3) assess performance on the task under the influence of ethyl alcohol. Response times and accuracy were measured on five subjects under various conditions over a five-week period. Analysis of the data indicated a substantial dependence of response times on certain stimuli characteristics. In addition, there was a definite decline in accuracy corresponding to a forced decrease in response time. However, the relationship could not be adequately represented by the proposed speed-

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accuracy tradeoff functions. The effect of alcohol was evidenced primarily by a change in the slope of the speed-accuracy tradeoff relationship.

DESCRIPTORS: (U) *Information processing, *Reaction time, *Flight training, *Performance(Human), Accuracy, Measurement, Stimuli, Alcohol consumption, Workload, Air Force training

IDENTIFIERS: (U) Spatial orientation, WUAFOSR2313D9, PEG1102F

AD-A145 205 12/1

FLORIDA STATE UNIV TALLAHASSEE DEPT OF STATISTICS
(U) Total Positivity. A Review.

DESCRIPTIVE NOTE: Technical rept.,

JUN 84 20P

PERSONAL AUTHORS: Kim, J. S. ; Proschan, F. ;

REPORT NO. FSU-STATISTICS-M663, TR-83-159-AFOSR

CONTRACT NO. F49820-82-K-0007

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR
TR-84-0717

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Supersedes AD-A133 691.

ABSTRACT: (U) The main objective of this paper is to review the concepts of total positivity, which plays an important role in various domains of mathematics and statistics. This article describes the power and scope of total positivity, and samples the great variety of fields of its applications. (Author)

DESCRIPTORS: (U) *Functions(Mathematics), *Statistical processes, Probability density functions, Set theory, Inventory, Statistical decision theory, Multivariate analysis, Reliability, Life tests

IDENTIFIERS: (U) Total positivity theory, WUAFOSR2304A5, PEG1102F

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AD-A145 149 20/4 12/1

WASHINGTON STATE UNIV PULLMAN DEPT OF CIVIL AND ENVIRONMENTAL ENGINEERING

NOTRE DAME UNIV IN AERODYNAMICS LAB

(U) Effect of Toluene on the Solubility of Biohazardous Volatile Synthetic Organic Compounds.

(U) Aerodynamics of Airfoils Subject to Three-Dimensional Periodic Gusts.

DESCRIPTIVE NOTE: Final rept. 1 Jun 83-31 May 84.

DESCRIPTIVE NOTE: Final rept..

JUL 84 38P

AUG 83 55P

PERSONAL AUTHORS: Hindin, E. ;

PERSONAL AUTHORS: Atassi, H. ;

CONTRACT NO. AFOSR-83-0175

REPORT NO. 1983-12

PROJECT NO. 2303

CONTRACT NO. AFOSR-82-0289

TASK NO. D9

PROJECT NO. 2307

MONITOR: AFOSR

TASK NO. A4

TR-84-0760

MONITOR: AFOSR

TR-84-0757

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) The solubility of toluene, benzene, 1,1,2, trichloroethylene and p-cresol singly in high purity water at 20 degrees C was determined under dynamic and static conditions. Toluene present in an aqueous solutions enhanced the benzene solubility, decreased the time for solubility to be attained and increased the rate at which solubility was attained. Toluene present in the water caused little difference in the time for 1,1,2 trichloroethylene to reach solubility equilibrium, but caused a more rapid rate in attaining solubility equilibrium and increased the solubility equilibrium concentration. The effect of toluene on the solubility kinetics of p-cresol was to reduce the time in attaining solubility equilibrium, increase the rate in achieving solubility equilibrium and caused little change in the solubility concentration. (Author)

DESCRIPTORS: (U) *Toluenes, *Solubility, *Toxic agents, Volatility, Solutions(Mixtures), Water, Benzene, Kinetics, Trichloroethylene, Paint removers

IDENTIFIERS: (U) Degreasers, PEG1102F

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ABSTRACT: (U) A general analysis of periodic three-dimensional vortical disturbances of streaming motions around streamlined and bluff bodies is developed using a unified approach wherein the mathematical problem is reduced to solving a single inhomogeneous wave equation with non-constant coefficients. In the limit of vanishing Mach number, the problem is formulated in terms of an inhomogeneous Fredholm integral equation of the second kind. The analysis is first applied to study the unsteady aerodynamics of an airfoil of arbitrary shape moving at low Mach number in a three-dimensional periodic gust pattern. Because the homogeneous equation has a non-trivial solution, a special procedure was developed for its solution and uniqueness is obtained by applying the Kutta condition at the trailing edge. Results were compared with those obtained from a nonlinear two dimensional gust theory and linear oblique gust analyses. Comparison shows a very strong influence of the airfoil geometry and mean flow angle of attack and of the gust parameters on the unsteady lift and moment coefficients. In fact, depending on the conditions considered, the unsteady lift and moment coefficients can be several times larger or smaller than those obtained from linear theories. A superposition principle was derived whereby the unsteady lift and moment acting on a thin airfoil

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with small camber and small angle of attack and subject to a two-dimensional gust can be constructed by linear superposition to the Sears lift and moment of three independent components accounting separately for the effects of airfoil thickness, airfoil camber and non-zero angle of attack of the mean flow.

DESCRIPTORS: (U) *Unsteady flow, *Gusts, *Airfoils, *Mathematical models, Periodic variations, Blunt bodies, Streamline shape, Three dimensional flow, Integral equations, Angle of attack, Lift, Thinness, Two dimensional flow, Camber, Blade airfoils, Gust loads, Mathematical prediction, Vortices, Heterogeneity, Aerodynamics, Coefficients, Moments, Trailing edges, Mean, Potential flow, Transfer functions, Stagnation point

IDENTIFIERS: (U) Unsteady aerodynamics, Lifting airfoils, Fredholm integral equations, Sears lift, PE8102F, WUAFOSR2307A4

FLORIDA UNIV GAINESVILLE CENTER FOR MATHEMATICAL SYSTEM THEORY

(U) Almost Finite Expansions of Arbitrary Semigroups.

84 53P

PERSONAL AUTHORS: Birget, J. C.; Rhodes, J. ;

CONTRACT NO. AFOSR-81-0238, DAAG29-81-K-0138

PROJECT NO. 2304

TASK NO. A6

MONITOR: AFOSR, ARD
TR-84-0721, 18343.39-MA

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Pure and Applied Algebra, v32 p239-287 1984.

Reprint: Almost Finite Expansions of Arbitrary Semigroups.

DESCRIPTORS: (U) *Groups(Mathematics), *Algebra, Numerical methods and procedures, Expansion, Global, Coordinates, Reprints

IDENTIFIERS: (U) *Semigroup theory, PE81102F, WUAFOSR2304A8

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SEARCH CONTROL NO. EVI19B

AD-A145 141

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PARIS-8 UNIV (FRANCE)

(U) Relationships between Electronic Structure and Stability of Metallic Glasses.

DESCRIPTIVE NOTE: Final scientific rept. 30 Sep 78-31 Dec 82.

MAY 84

45P

PERSONAL AUTHORS: Abeles, F.; Theye, M. L.; Van, V. N.;

CONTRACT NO. AFOSR-78-3701

PROJECT NO. 2308

TASK NO. C3

MONITOR: AFOSR
TR-84-0708

UNCLASSIFIED REPORT

ABSTRACT: (U) Amorphous Au-Ge and Ag-Ge alloy films were prepared by co-evaporation on low-temperature (15-20K) substrates under ultra-high vacuum for Ge concentrations between 20 and 40 at.%. Changes in short-range order have been observed by room-temperature electron diffraction experiments for Ge concentrations larger than 30 at.%. The d.c. electrical resistivity and the optical properties of the as-deposited amorphous metallic alloys are examined in detail as a function of composition. The Drude model with a constant relaxation time is found to reproduce the low-energy optical data satisfactorily.

DESCRIPTORS: (U) *Alloys, *Amorphous materials, *Glass, Electrical resistance, Optical properties, Relaxation time, Optical data, Electron diffraction, Ultra-high vacuum, Atomic structure, Germanium, Films, Gold, Silver

IDENTIFIERS: (U) *Metallic glasses, Electronic structure, PE81102F, WUAFOSR2308C3

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SEARCH CONTROL NO. EVI19B

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GEORGE WASHINGTON UNIV WASHINGTON D C DEPT OF OPERATIONS RESEARCH

(U) Assessing the Reliability of Computer Software and Computing Networks: An Opportunity for Partnership with Computer Scientists.

DESCRIPTIVE NOTE: Technical rept..

JUL 84 11P

PERSONAL AUTHORS: Barlow, R. E.; Singpurwalla, N. D.;

REPORT NO. ORC-84-7

CONTRACT NO. N00014-77-C-0283, AFOSR-81-0122

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR
TR-84-0821

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Prepared in cooperation with the George Washington Univ.

ABSTRACT: (U) This paper highlights three areas which are of importance in computer science, and in which statisticians can make valuable contributions. The authors outline these areas, survey the developments, and point out some of the open problems. The research areas are: software reliability, the reliability of fault tolerant computers, and the reliability of computer networks.

DESCRIPTORS: (U) *Computer program reliability, *Fault tolerant computing, *Networks, Computations, Computers, Interfaces, Statistics, Personnel, Mathematical models, Probability, Statistical inference

IDENTIFIERS: (U) Statisticians, PE81102F, MUNRO42372, WUAFOSR2304A5

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SEARCH CONTROL NO. EVI198

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CALIFORNIA UNIV SANTA BARBARA DEPT OF PHYSICS

DARTMOUTH COLL HANOVER N H DEPT OF CHEMISTRY

(U) Free Electron Lasers.

(U) The Octofluorocyclooctatetraene Radical Anion.
Identification and Proof of Aromaticity by Electron
Spin Resonance.

DESCRIPTIVE NOTE: Final technical rept. 1 Jan-1 Dec 83.

DEC 83 11P

84 5P

PERSONAL AUTHORS: Colson, W. B. ;

PERSONAL AUTHORS: Walther, B. W. ; Williams, F. ; Lemal, D. M.

CONTRACT NO. F49620-83-C-0043

CONTRACT NO. AFOSR-83-0047

PROJECT NO. 2301

PROJECT NO. 2303

TASK NO. A1

TASK NO. B2

MONITOR: AFOSR
TR-84-0737

MONITOR: AFOSR
TR-84-0762

UNCLASSIFIED REPORT

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ABSTRACT: (U) Further support of the LANL experiment and the strong-field synchrotron instability has used the periodic window for optical mode analysis. Using the LANL parameters current and magnetic field strength, the effect of the resonator or mode stability was examined. It was found that as much as 20% loss/pass was necessary for the FEL to run without sidebands. When the losses were dropped to 14% pass, a single sideband appeared in the untapered FEL planned at LANL. When the losses were lowered to 1% (as eventually planned), the optical field became chaotic and the FEL went broad band. (Author)

DESCRIPTORS: (U) *Lasers, *Free electrons, Equations, Electron beams, Broadband, Sidebands, Magnetic fields, Field intensity, Windows, Bibliographies, Reports

IDENTIFIERS: (U) *Free electron lasers, PE61102F,
WUAFOSR2301A1

SUPPLEMENTARY NOTE: Pub. in Jnl. of the American Chemical Society, v106 n3 p548-551 1984.

Reprint: The Octofluorocyclooctatetraene Radical Anion.
Identification and Proof of Aromaticity by Electron Spin
Resonance.

DESCRIPTORS: (U) *Aromatic compounds, Anions, Electron spin resonance, Irradiation, Synthesis (Chemistry), Reprints

IDENTIFIERS: (U) Octofluorocyclooctatetraene anions,
WUAFOSR2303B2, PE61102F

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AD-A145 090 12/1 9/2

DARTMOUTH COLL HANOVER N H DEPT OF CHEMISTRY

(U) Perfluorotropilidene Valence Isomers and the
Perfluorotropylium Ion,

84

3P

PERSONAL AUTHORS: Dalley, W. P. ; Lemal, D. M. ;

CONTRACT NO. AFOSR-83-0047, NSF-CHE79-24309

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR
TR-84-0784

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of the American Chemical
Society, v108 p1189-1170 1984.

Reprint: Perfluorotropilidene Valence Isomers and the
Perfluorotropylium Ion.

DESCRIPTORS: (U) *Isomers, Valence, Ions, Fluorine
compounds, Reprints

IDENTIFIERS: (U) *Tropilidene/perfluoro,
*perfluorotropilidene, Fluorocarbons, Perfluorotropylium
ions, WUAFOSR2303B2, PE61102F

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MASSACHUSETTS INST OF TECH CAMBRIDGE STATISTICS CENTER
(U) Numerical Algorithms and Parallel Tasking.

DESCRIPTIVE NOTE: Interim rept. 15 May 83-14 May 84.

JUL 84

5P

PERSONAL AUTHORS: Klema, V. ;

CONTRACT NO. AFOSR-82-0210

PROJECT NO. 2304

TASK NO. A3

MONITOR: AFOSR
TR-84-0744

UNCLASSIFIED REPORT

ABSTRACT: (U) During this research period progress was
made on the system integration of the software tasker to
support algorithmic and applications segmentation for
concurrent computing. This permits an efficient
distribution of code and data on processing elements. The
tasker provides primitives to support the segmenting of
processes, monitors execution on worker processors by the
manager on each concurrent system, and achieves
asynchronous communication among worker processors and
between the manager processor and the workers. (Author)

DESCRIPTORS: (U) *Algorithms, *Parallel processing,
*Integrated systems, Computations, Dual mode,
Asynchronous systems, Computer communications, Research
management, Coding, Microprocessors, Signal processing,
Image processing

IDENTIFIERS: (U) MIMD(Multiple Instruction Multiple Data)
PE61102F, WUAFOSR2304A3

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SEARCH CONTROL NO. EVI198

AD-A145 082 12/1

AD-A145 081 12/1

FLORIDA UNIV GAINESVILLE CENTER FOR MATHEMATICAL SYSTEM THEORY

FLORIDA STATE UNIV TALLAHASSEE DEPT OF STATISTICS

(U) Realization of Covariance Sequences.

(U) An Integral Inequality with Applications to Order Statistics.

81

13P

DESCRIPTIVE NOTE: Technical rept..

PERSONAL AUTHORS: Kalman, R. E. ;

JUN 84 19P

CONTRACT NO. AFOSR-76-3034, DAAG29-77-G-0225

PERSONAL AUTHORS: Boland, P. J. ; Proschan, F. ;

PROJECT NO. 2304

REPORT NO. FSU-STATISTICS-M881, TR-83-189-AFOSR

TASK NO. A8

CONTRACT NO. F49620-82-K-0007

MONITOR: AFOSR

MONITOR: AFOSR
TR-84-0713

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Presented at Toeplitz Memorial Conference, 12 May 81, Tel Aviv, Israel.

SUPPLEMENTARY NOTE: Prepared in cooperation with University Coll., Dublin. Dept. of Mathematics.

ABSTRACT: (U) This paper examines the problem of positivity in relation to the partial realization of scalar power series. An exact criterion of positivity is proved for second-order realizations. The general case is currently unsolved. Even the special results contained here show that the so-called maximum entropy principle cannot be applied to the realization problem in the naive sense in which it is employed by physicists. It would be better to call this principle a prejudice because it does not fully utilize the information inherent in the data and does not provide a realization with natural (minimal) mathematical properties. (Author)

ABSTRACT: (U) Document discusses life distribution functions. Applications in reliability theory and order statistics are given.

DESCRIPTORS: (U) *Sequences(Mathematics), *Covariance, Power series, Scalar functions, Entropy, Physicists, Coefficients, Polynomials, Parameters

DESCRIPTORS: (U) *Inequalities, *Integrals, *Order statistics, Distribution functions, Reliability, Theory, Random variables, Transformations(Mathematics), Functions(Mathematics)

IDENTIFIERS: (U) WUAFOSR2304A8, PE81102F

IDENTIFIERS: (U) *Life distribution functions, WUAFOSR2304A5, PE81102F

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AD-A145 056 7/5

FLORIDA STATE UNIV TALLAHASSEE DEPT OF STATISTICS

DARTMOUTH COLL HANOVER N H DEPT OF CHEMISTRY

(U) Testing Whether New is Better than Used of a Specified Age, with Randomly Censored Data.

(U) Photochemistry of Perfluoro-3-diazo-2-butanone,

DESCRIPTIVE NOTE: Technical rept.,

83 3P

DEC 83 18P

PERSONAL AUTHORS: Laganis, E. D. ; Janik, D. S. ; Curphey, T. J. ; Lema, D. M. ;

PERSONAL AUTHORS: Hollander, M. ; Park, D. H. ; Proschan, F. ;

CONTRACT NO. AFOSR-83-0047

REPORT NO. FSU-STATISTICS-M669, TR-83-164-AFOSR

PROJECT NO. 2303

CONTRACT NO. F49620-82-K-0007

TASK NO. B2

PROJECT NO. 2304

MONITOR: AFOSR
TR-84-0763

TASK NO. A5

MONITOR: AFOSR
TR-84-0716

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) Using randomly censored data, the authors develop a test of the null hypothesis that a new item has stochastically the same residual life length as does a used item of specified age t sub 0, versus the alternative hypothesis that a new item has stochastically greater residual life length than does a used item of age t sub 0. They also compare our test with a related test, developed for a complete-data model, in order to study the loss in efficiency because of censoring. (Author)

DESCRIPTORS: (U) *Statistical tests, *Stochastic processes, *Probability distribution functions, Mathematical models, Survivability, Failure, Hypotheses, Random variables, Cancer, Patients

IDENTIFIERS: (U) Life distributions, PE81102F

SUPPLEMENTARY NOTE: Pub. in Jnl. of the American Chemical Society, v105 n25 p7457-7459 1983.

Reprint: Photochemistry of Perfluoro-3-diazo-2-butanone.

DESCRIPTORS: (U) *Photochemical reactions, Butanones, Synthesis (Chemistry), Reprints

IDENTIFIERS: (U) Perfluoro-3-diazo-2-butanone, Oxirenes, PE81102F, WUAFOSR2303B2

AD-A145 060

AD-A145 056

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A145 050 13/13 11/2 AD-A145 050 CONTINUED

S-CUBED LA JOLLA CA

(U) Development of Advanced Constitutive Model for Reinforced Concrete.

DESCRIPTIVE NOTE: Final rept. 1 Mar 81-29 Feb 84.

APR 84 177P

PERSONAL AUTHORS: Hegemier, G. A. ; Read, H. E. ; Murakami, H.

REPORT NO. SSS-R-84-8884

CONTRACT NO. F49620-81-C-0033

PROJECT NO. 2307

TASK NO. C2

MONITOR: AFOSR
TR-84-0750

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Prepared in cooperation with Defense Nuclear Agency, Contract DNA001-84-C-0127.

ABSTRACT: (U) The objective of this research was to develop an advanced, nonlinear, multiaxial constitutive theory for reinforced concrete which provides a modeling capability that is superior to existing models, especially in the nonlinear response regime. The problem of constructing such a theory is partitioned into two major tasks, which have been pursued concurrently. One task consists of formulating a procedure (mixture theory) for analytically mixing reinforcing steel and plain concrete, so that the interaction between the two, which plays a key role in the overall behavior of reinforced concrete, is properly modeled. The other task consists of developing a model of plain concrete, which accurately portrays its nonlinear, multiaxial behavior and which is computationally feasible for use in conjunction with the mixture theory. The mixture theory is designed to synthesize the global constitutive properties of reinforced concrete from the properties of plain concrete, steel, interfaces and reinforcing geometry. The progress made during the course of the program toward achieving the above research objectives is summarized. A detailed

account of the accomplishments made during the third year of the program are given, since these are not available elsewhere. Finally, a list of the publications and technical interactions which resulted from this research is given.

DESCRIPTORS: (U) *Reinforced concrete, Structural response, Concrete, Steel, Interactions, Mixtures, Theory, Rock, Soils, Strain(Mechanics), Modification, Stress waves

IDENTIFIERS: (U) *Strain softening, Constitutive models

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI19B

AD-A145 045 9/2 12/1

AD-A145 044 12/1 9/4

STANFORD UNIV CA DEPT OF CHEMISTRY

FLORIDA UNIV GAINESVILLE

(U) Set-Theoretic Problems of Null Completion in Relational Databases.

(U) We Can Do Something about Multicollinearity.

DESCRIPTIVE NOTE: Technical rept..

84 14P

84 5P

PERSONAL AUTHORS: Kalman, R. E. ;

PERSONAL AUTHORS: Keller, A. M. ;

CONTRACT NO. AFOSR-81-0238, DAAG29-81-K-0138

PROJECT NO. AFOSR-80-0212

PROJECT NO. 2304

TASK NO. A7

TASK NO. A6

MONITOR: AFOSR
TR-84-0711

MONITOR: AFOSR, ARO
TR-84-0722, 18343.33-MA

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Commun. Statist.-Theor. Method., v13 n2 p115-125 1984.

ABSTRACT: (U) When considering using databases to represent incomplete information, the relationship between two facts where one may imply the other needs to be addressed. In relational databases, this question becomes whether null completion is assumed. That is, does a (possibly partially-defined) tuple imply the existence of tuples that are less informative than the original tuple. We show that no relational algebra, that assumes equivalence under null completion, can include set-theoretic operators that are compatible with ordinary set theory. (Author)

Reprint: We Can Do Something about Multicollinearity.

DESCRIPTORS: (U) *Mathematical models, *Information theory, Confluence, Econometrics, Macroeconomics, Economic analysis, France, United States, Matrices(Mathematics), Reprints

IDENTIFIERS: (U) *Multicollinearity, Frisch scheme, Noisy data, PE61102F, WJAFOSR2304A6

DESCRIPTORS: (U) *Data bases, *Set theory, Theorems, Integration, Models, Information systems

IDENTIFIERS: (U) *Null completion, PE61102F, WJAFOSR2304A7

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A145 040 20/4 20/13

AD-A145 040 CONTINUED

OKLAHOMA UNIV NORMAN SCHOOL OF AEROSPACE MECHANICAL AND
NUCLEAR ENGINEERING

Velocity, Profiles, Curve fitting, Sand

(U) Turbulent Boundary Layers Over Rough Surfaces
Hypersonic Flow.

IDENTIFIERS: (U) Law of the wall, Rotta energy equation,
Van Driest transformation theory, PEG1102F, WJAFOSR230708

DESCRIPTIVE NOTE: Final rept. 1 May 83-30 May 84.

JUN 84 43P

PERSONAL AUTHORS: Russell, J. M. ;

CONTRACT NO. AFOSR-83-0196

PROJECT NO. 2307

TASK NO. D8

MONITOR: AFOSR
TR-84-0756

UNCLASSIFIED REPORT

ABSTRACT: (U) A method for predicting the downstream development of momentum thickness, skin friction, and heat transfer in a supersonic turbulent boundary layer over a rough flat plate based on ideas of Van Driest, Rotta, and Bradshaw is derived and discussed. Admissible thermal boundary conditions include the case of prescribed wall temperature and the case of an adiabatic wall. The velocity profiles for compressible nonadiabatic flow are expressed as transformations of the corresponding velocity profiles in incompressible adiabatic flow. Analytical curve fits to the experimentally determined law-of-the-wall (including the sublayer region) are given, as are analytical representations of the effects of sand grain roughness based on the well known data of Nikuradse. A FORTRAN source code for implementing the method is included as are sample calculations of the momentum thickness, skin friction, and heat transfer for several roughness heights. (Author)

DESCRIPTORS: (U) *Turbulent boundary layer, *Hypersonic flow, *Surface roughness, Height, Momentum, Thickness, Skin friction, walls, Adiabatic conditions, Aerothermodynamics, FORTRAN, Mathematical prediction, Computer programs, Algorithms, Compressible flow, Transformations(Mathematics), Incompressible flow.

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OTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A145 018 9/2

AD-A145 014 12/1

STANFORD UNIV CA DEPT OF COMPUTER SCIENCE

NORTH CAROLINA UNIV AT CHAPEL HILL DEPT OF STATISTICS

(U) A Reasonable View Update Translator that Preserves No Complement.

(U) Uniform Consistency of a Class of Regression Function Estimators.

DESCRIPTIVE NOTE: Technical rept.,

84 13P

84 3P

PERSONAL AUTHORS: Hardle, W. ; Luckhaus, S. ;

PERSONAL AUTHORS: Keller, A. M. ;

CONTRACT NO. F49620-82-C-0009

CONTRACT NO. AFOSR-80-0212

PROJECT NO. 2304

PROJECT NO. 2304

TASK NO. A5

TASK NO. A7

MONITOR: AFOSR
TR-84-0731

MONITOR: AFOSR
TR-84-0709

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. In The Annals of Statistics, v12
n2 p812-823 1984.

DESCRIPTORS: (U) *Translators, Data bases, User needs,
Access

Reprint: Uniform Consistency of a Class of Regression
Function Estimators.

IDENTIFIERS: (U) Relational data bases, PE81102F,
WJAFOSR2304A7

DESCRIPTORS: (U) *Regression analysis,
*Functions(Mathematics), *Estimates, Nonparametric
statistics, Stochastic processes, Consistency, Kernel
functions, Bandwidth, Reprints

IDENTIFIERS: (U) PE81102F

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SEARCH CONTROL NO. EVI198

AD-A145 012

7/3

MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF CHEMISTRY

(U) Hexamethylsilirane. 8. Conversion to 1-Oxa-2-Silacyclopentanes by 'Two-Atom' Insertion Reactions of Aldehydes and Ketones.

84

6P

PERSONAL AUTHORS: Seyferth, D. ; Duncan, D. P. ; Shannon, M. L.

CONTRACT NO. AFOSR-83-0003

PROJECT NO. 2303

TASK NO. 82

MONITOR: AFOSR
TR-84-0785

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Organometallics, v3 n4 p579-583 1984.

Reprint: Hexamethylsilirane. 8. Conversion to 1-Oxa-2-Silacyclopentanes by 'Two-Atom' Insertion Reactions of Aldehydes and Ketones.

DESCRIPTORS: (U) *Silicon compounds, Cyclic compounds, Aldehydes, Ketones, Reprints

IDENTIFIERS: (U) *Siliranes/Hexamethyl, Insertion reactions, PE81102F

AD-A145 012

UNCLASSIFIED

AD-A145 011

7/3

MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF CHEMISTRY

(U) Hexamethylsilirane. IV. Nucleophilic Ring Opening by Alkylolithium Reagents.

84

6P

PERSONAL AUTHORS: Seyferth, D. ; Wiseman, G. H. ; Amarelli, D. C. ; Shannon, M. L. ;

CONTRACT NO. AFOSR-83-0003

PROJECT NO. 2303

TASK NO. 82

MONITOR: AFOSR
TR-84-0785

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Organometallic Chemistry, v284 p149-153 1984.

Reprint: Hexamethylsilirane. IV. Nucleophilic Ring Opening by Alkylolithium Reagents.

DESCRIPTORS: (U) *Grignard reactions, *Lithium compounds, Reprints, Organometallic compounds

IDENTIFIERS: (U) *Siliranes/Hexamethyl, Nucleophilic reactions, Ring openings, PE81102F

AD-A145 011

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A145 009 3/2 20/9

AD-A145 009 CONTINUED

CALIFORNIA UNIV SAN DIEGO LA JOLLA CENTER FOR
ASTROPHYSICS AND SPACE SCIENCES

Plasmas(Physics), Pressure gradients, Energy transfer,
Electrons, Magnetic fields, Twist(Motion)

(U) Studies of Solar Flares and Coronal Loops.

IDENTIFIERS: (U) Coronal loops, PE61102F, WUAFOSR2311A1

DESCRIPTIVE NOTE: Final scientific rept. 1 Feb 82-31 May
84.

JUL 84 241P

PERSONAL AUTHORS: Canfield, R. G. ;

REPORT NO. UCSD-SP-84-21

CONTRACT NO. AFOSR-82-0092

PROJECT NO. 2311

TASK NO. A1

MONITOR: AFOSR
TR-84-0719

UNCLASSIFIED REPORT

ABSTRACT: (U) The objectives of this research were to improve our understanding of solar flares and solar flares and solar coronal loops. The specific approach to the flare objective was to analyze and interpret solar flare data, using theoretical methods developed as part of the research. The specific approach to the coronal loop objective was to investigate their thermal and magnetohydrodynamic stability for various physical models. The principal result of the flare research was to demonstrate that, in two well-observed flares, the mechanism of chromospheric evaporation accounts for the observed amount of flare X-ray plasma. The dominant energy transport mechanism is thermal conduction. Heating by energetic electrons is of secondary importance. The principal results of the magnetohydrodynamic stability analyses were demonstrations of the role of radiative energy loss, compressibility, magnetic field line twist, foot-point magnetic field line tying, and radial plasma pressure gradient.

DESCRIPTORS: (U) *Chromosphere, *Solar flares, *Solar corona, Radiative transfer, Loops, Thermal stability, Magnetohydrodynamics, Stability, Models, Thermal conductivity, Solar x rays, Heating, Evaporation.

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AD-A144 996 12/1

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CALIFORNIA UNIV BERKELEY OPERATIONS RESEARCH CENTER

statistics for each moment. (Author)

(U) Credibility Approximations for Bayesian Prediction of Second Moments.

DESCRIPTORS: (U) *Mathematical prediction, *Bayes theorem, *Forecasting, *Least squares method, Variations, Linear systems, Computations, Approximations(Mathematics), Mathematical models, Formulas(Mathematics), Moments, Matrices(Mathematics), Observation, Estimates

DESCRIPTIVE NOTE: Technical rept..

MAR 84 44P

IDENTIFIERS: (U) *Credibility theory, PE61102E

PERSONAL AUTHORS: Jewell, W. S. ; Schnieper, R. ;

REPORT NO. ORC-84-3

CONTRACT NO. AFOSR-81-0122

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR
TR-84-0820

UNCLASSIFIED REPORT

ABSTRACT: (U) Credibility theory refers to the use of linear least-squares theory to approximate the Bayesian forecast of the mean of a future observation; families are known where the credibility formula is exact Bayesian. Second-moment forecasts are also of interest, for example, in assessing the precision of the mean estimate. For some of these same families, the second-moment forecast is exact in linear and quadratic functions of the sample mean. On the other hand, for the normal distribution with normal-gamma prior on the mean and variance, the exact forecast of the variance is a linear function of the sample variance and the squared deviation of the sample mean from the prior mean. Suhliemann has given a credibility approximation to the variance in terms of the sample mean and sample variance. This paper presents a unified approach to estimating both first and second moments of future observations using linear functions of the sample mean and two sample second moments; the resulting least-squares analysis requires the solution of a 3 x 3 linear system, using 11 prior moments from the collective and giving joint predictions of all moments of interest. Previously developed special class follow immediately. For many analytic models of interest, one can replace the 3-dimensional joint prediction with three independent credibility forecasts using the natural

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SEARCH CONTROL NO. EVI198

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12/1

NORTH CAROLINA UNIV AT CHAPEL HILL DEPT OF STATISTICS

(U) Power Transformations When Fitting Theoretical Models to Data.

JUN 84 9P

PERSONAL AUTHORS: Carroll, R. J.; Ruppert, D. ;

CONTRACT NO. F49620-82-C-0008, NSF-MCS81-00748

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR
TR-84-0729

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of the American Statistical Association, v79 n386 p321-328 Jun 84.

Reprint: Power Transformations When Fitting Theoretical Models to Data.

DESCRIPTORS: (U) *Transformations(Mathematics), *Nonlinear analysis, *Regression analysis, Mathematical models, Asymptotic normality, Monte Carlo method, Reprints

IDENTIFIERS: (U) Power transformations, *Nonlinear regression analysis, PE81102F, WUAFOSR2304A5

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AD-A144 979

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AD-A144 979 12/1

WASHINGTON STATE UNIV PULLMAN DEPT OF PURE AND APPLIED MATHEMATICS

(U) Stationarity and Superlinear Convergence of an Algorithm for Univariate Locally Lipschitz Constrained Minimization.

84 24P

PERSONAL AUTHORS: Mifflin, R. ;

CONTRACT NO. AFOSR-83-0210

PROJECT NO. 2304

TASK NO. A1

MONITOR: AFOSR
TR-84-0742

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Mathematical Programming, v28 p50-71 1984.

Reprint: Stationarity and Superlinear Convergence of an Algorithm for Univariate Locally Lipschitz Constrained Minimization.

DESCRIPTORS: (U) *Algorithms, *Functions(Mathematics), *Convergence, Mathematical programming, Optimization, Problem solving, Reprints

IDENTIFIERS: (U) Locally Lipschitz functions, PE81102F, WUAFOSR2304A1

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A144 972 CONTINUED

VANDERBILT UNIV NASHVILLE TN DEPT OF PHARMACOLOGY

(U) Nerve Agent Toxicity and Its Prevention at the Neuromuscular Junction; an Analysis of Acute and Delayed Toxic Effects in Extraocular and Skeletal Muscle.

*Acetylcholinesterase, Inhibition, Neuromuscular transmission, Recovery, Activation, Junctions, Muscles, Muscle fibers, Rats, Cholinesterase inhibitors

IDENTIFIERS: (U) PE61102F, WUAFOSR2312A3

DESCRIPTIVE NOTE: Final technical rept. 15 Sep 82-31 Mar 84.

MAY 84 17P

PERSONAL AUTHORS: Dettbarn, W. D. ;

CONTRACT NO. AFOSR-82-0310

PROJECT NO. 2312

TASK NO. A3

MONITOR: AFOSR
TR-84-0748

UNCLASSIFIED REPORT

ABSTRACT: (U) The nerve agent soman (0.080 mg/kg s.c.), as well as other organophosphates in concentrations that cause cholinergic symptoms, DFP (1.5 mg/kg s.c.), paraoxon (0.23 mg/kg s.c.), and tertiary (0.2 mg s.c.) and quaternary phospholine (0.080 mg/kg s.c.) induced a progressive, dose-related necrosis in rat skeletal muscle fiber. The severity of the myopathy depended on a critical decrease and duration of AChE inhibition. The fast type II fibers appeared to be the more affected fibers in all muscles tested. The necrotic nerve fibers were repaired within one week. Examination of muscle fibers 2 and 3 weeks after a single injection of soman showed a large number of ragged red fibers in the diaphragm and soleus muscle. Following AChE inhibition, the 4S molecular form of AChE showed the fastest recovery as compared with the 10S, 12S and 16S forms. The half-time recovery rate of AChE after inhibition depended on the inhibitor used and the tissue investigated. In general, half-time rate of recovery was slowest in brain and nerve and fastest in SOL and EDL muscle. AChE activity of peripheral nerve was barely inhibited by soman and had recovered to control activity within 24 hours.

DESCRIPTORS: (U) *Toxicity, *Nerve agents, *GD agent.

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AD-A144 969 12/1 9/3

AD-A144 968 12/1

SCIENTIFIC RESEARCH ASSOCIATES INC GLASTONBURY CT

WASHINGTON UNIV SEATTLE DEPT OF MATHEMATICS

(U) Solution of the Boltzmann Transport Equations for a Permeable Base Transistor.

(U) Marginal Values and Second-Order Necessary Conditions for Optimality.

DESCRIPTIVE NOTE: Final rept. 17 Oct 83-31 May 84.

JUL 84 37P

83 43P

PERSONAL AUTHORS: Rockafellar, R. T. ;

PERSONAL AUTHORS: Buggeln, R. C. ; Kreskovsky, J. P. ; Grubin, H. L. ;

CONTRACT NO. F48620-82-K-0012

REPORT NO. SRA-R84-910008-F

PROJECT NO. 2304

CONTRACT NO. F48620-83-C-0157

TASK NO. A8

PROJECT NO. 3005

MONITOR: AFOSR

TR-84-0732

TASK NO. A1

MONITOR: AFOSR
TR-84-0707

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Mathematical Programming. v28
p245-286 1983.

UNCLASSIFIED REPORT

ABSTRACT: (U) A description of a numerical method for solving the Boltzmann transport equations is presented. This numerical technique is applied to the case of the solution of the Boltzmann equations for a gallium arsenide permeable base transistor. Calculated results are presented for two base potentials. (Author)

Reprint: Marginal Values and Second-Order Necessary Conditions for Optimality.

DESCRIPTORS: (U) *Nonlinear programming. Methodology. Optimization, Parametric analysis, Value, Lagrangian functions, Reprints

IDENTIFIERS: (U) PEB1102F. WJAFOSR2304A8

DESCRIPTORS: (U) *Numerical methods and procedures. *Boltzmann equation. *Solutions (General). Transistors. Permeability. Gallium arsenides. Diffusion. Transport properties. Drift. Electrical properties. Charts. Algorithms

IDENTIFIERS: (U) Transport equations. PEB1102F.
WJAFOSR3005A1

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A144 943

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AD-A144 942

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20/9

MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF CHEMISTRY

(U) Hexamethylsilirane. 5. Conversion to Five-Membered Ring Silicon Compounds by 'Two-Atom' Insertion Reactions of Aryl Olefins, 1,3-Dienes, and Conjugated Acetylenes.

84

8P

PERSONAL AUTHORS: Seyferth, D. ; Duncan, D. P. ; Shannon, M. L. ; Goldman, E. W. ;

CONTRACT NO. AFOSR-83-0003

PROJECT NO. 2303

TASK NO. 82

MONITOR: AFOSR
TR-84-0767

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Organometallics, v3 n4 p574-578 1984.

Reprint: Hexamethylsilirane. 5. Conversion to Five-Membered Ring Silicon Compounds by 'Two-Atom' Insertion Reactions of Aryl Olefins, 1,3-Dienes, and Conjugated Acetylenes.

DESCRIPTORS: (U) *Silicon compounds, Unsaturated hydrocarbons, Chemical reactions, Reprints

IDENTIFIERS: (U) *Silirane/hexamethyl, *Insertion reactions, Ring compounds, MUAFOSR2303B2, PE81102F

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RUTGERS - THE STATE UNIV NEW BRUNSWICK N J DEPT OF MATHEMATICS

(U) Exact Results for the Two-Dimensional Two-Component Plasma.

JUN 84

5P

PERSONAL AUTHORS: Nicolalde, D. ;

CONTRACT NO. AFOSR-82-0016

PROJECT NO. 2301

TASK NO. A8

MONITOR: AFOSR
TR-84-0740

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Physics Letters, v103A n1,2 p84-86, 18 Jun 84.

Reprint: Exact Results for the Two-Dimensional Two-Component Plasma.

DESCRIPTORS: (U) *Computations, *Plasmas(Physics), Free energy, Correlation techniques, Two dimensional, Temperature

IDENTIFIERS: (U) Reprints, MUAFOSR2301A8, PE81102F

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A144 941 6/15

LOS ALAMOS NATIONAL LAB NM

(U) Performance Enhancement.

DESCRIPTIVE NOTE: Final rept..

MAR 84 13P

PERSONAL AUTHORS: George, J. S.; Bitensky, M. W. ;

CONTRACT NO. AFOSR-MIPR-82-00084

PROJECT NO. 2312

TASK NO. A1

MONITOR: AFOSR
TR-84-0748

UNCLASSIFIED REPORT

ABSTRACT: (U) Work thus far has focused on a class of tricyclic antidepressants (TADS) whose action has a gradual onset associated with the metabolic response to the drugs. Chronic treatment of rats with TADS sensitized synaptosomal adenylylase cyclase (AC) to activation with guanyl nucleotides. The research has attempted to describe anatomical and functional localization of the response, probe the biochemical mechanism of observed effects; and look for behavioral correlates of biochemical changes. An interesting finding is that unlike the hypothalamic or cortical enzyme, enzyme, cerebellar synaptosomal AC is not sensitized to nucleotide activation. Other TAD associated changes are seen in cerebellum. A number of plausible biochemical mechanisms for the observed TAD responses have been investigated, and several additional possibilities have been identified. The precise mechanisms involved remains unclear. Several behavioral tests were employed to attempt to quantify observed behavioral differences between control and TAD-treated animals. The most significant observed differences was in the range and variance of responses between groups. More sophisticated and sensitive experimental paradigms are being developed.

DESCRIPTORS: (U) *Drugs, Behavior, Metabolism, Response(Biology), Rats, Activation, Nucleotides, Biochemistry, Hypothalamus

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IDENTIFIERS: (U) *Antidepressants, WUATOSR2312A1, PEB1102F

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A144 940 12/1

AD-A144 937 9/2 12/1

CALIFORNIA UNIV BERKELEY OPERATIONS RESEARCH CENTER

STANFORD UNIV CA DEPT OF COMPUTER SCIENCE

(U) Simulation Uses of the Exponential Distribution.

(U) Updating Logical Databases.

DESCRIPTIVE NOTE: Technical rept..

DESCRIPTIVE NOTE: Technical rept..

JUN 84 22P

84 15P

PERSONAL AUTHORS: Ross, S. M. ; Schechner, Z. ;

PERSONAL AUTHORS: Fagin, R. ; Kuper, G. M. ; Ullman, J. ; Vardi, M. Y. ;

REPORT NO. ORC-84-8

CONTRACT NO. AFOSR-80-0212

PROJECT NO. 2304

TASK NO. A7

MONITOR: AFOSR
TR-84-0819

MONITOR: AFOSR
TR-84-0712

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) This paper indicates how exponential random variables can be efficiently used in a variety of simulation problems. One of the problems is the simulation of order statistics from a normal population. The authors discuss the general problem of simulating order statistics and then consider the normal case. They start by showing how the Von-Neumann rejection approach via the exponential can be modified to become an efficient algorithm for generating a normal and then present a method for generating normal order statistics. They show how to use the exponential to efficiently simulate random permutations with weights. They consider the problem of simulating a 2-dimensional Poisson process both for a homogeneous and nonhomogeneous Poisson process. (Author)

SUPPLEMENTARY NOTE: Prepared in cooperation with IBM Research Lab., Jan Jose, CA.

ABSTRACT: (U) The authors suggest a new approach to database updates, in which a database is treated as a collection of theories. They investigate two issues: simultaneous multiple update operations, and equivalence of databases under update operations. (Author)

DESCRIPTORS: (U) *Data bases, *Theory, Logic, Multiple operation, Semantics

IDENTIFIERS: (U) Update operation, Flock, WUAFOSR2304A7, PEG1102F

DESCRIPTORS: (U) *Exponential functions, *Distribution functions, *Random variables, *Simulation, Order statistics, Algorithms, Two dimensional, Homogeneity, Poisson equation, Permutations

IDENTIFIERS: (U) Von Neumann rejection technique, *Exponential distribution, PEG1102F, WUAFOSR2304A5

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DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. EVI198

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ROCHESTER UNIV NY

AD-A144 845

12/1

PITTSBURGH UNIV PA CENTER FOR MULTIVARIATE ANALYSIS

(U) Laser Speckle and Related Phenomena.

84

69P

PERSONAL AUTHORS: Dainty, J. C. ;

CONTRACT NO. AFOSR-81-0003

PROJECT NO. 2311

TASK NO. A1

MONITOR: AFOSR
TR-84-0848

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Topics in Applied Physics, v9
p255-320 1984.

Reprint: Laser Speckle and Related Phenomena.

DESCRIPTORS: (U) *Astronomical bodies, *Interferometry, ..
Signal to noise ratio, Photographic images, Resolution,
Diffraction, Mathematical models, Algorithms,
Bibliographies, Reprints

IDENTIFIERS: (U) Stellar interferometry, *Speckle
interferometry, WUAFOSR2311A1, PE61102F

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AD-A144 845

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EV1198

(U) Some Weak and Strong Laws of Large Numbers for $D(0,1)$ -
Valued Random Variables.

DESCRIPTIVE NOTE: Technical rept..

JUL 84 45P

PERSONAL AUTHORS: Wang, X. C. ; Rao, M B. ;

REPORT NO. TR-84-36

CONTRACT NO. F49620-82-K-0001

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR
TR-84-0714

UNCLASSIFIED REPORT

ABSTRACT: (U) Pointwise Weak Law of Large Numbers and
Weak Law of Large Numbers in the norm topology of $D(0,1)$
are shown to be equivalent under uniform convex tightness
and uniform integrability conditions for weighted sums of
a sequence of random elements in $D(0,1)$. Uniform convex
tightness and uniform integrability conditions are
jointly characterized. Marcinkiewicz-Zygmund-Kolmogorov's
and Brunk-Chung's Strong Laws of Large Numbers are
derived in the setting of $D(0,1)$ - space under uniform
convex tightness and uniform integrability conditions.
Equivalence of pointwise convergence, convergence in the
Skorokhod topology and convergence in the norm topology
for sequences in $D(0,1)$ is studied. (Author)

DESCRIPTORS: (U) *Random variables, *Numbers,
*Convergence, Topology, Banach space, Convex bodies,
*Tightness, Stochastic processes, Theorems

IDENTIFIERS: (U) WUAFOSR2304A5, PE61102F

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A144 756 CONTINUED

AD-A144 756 12/1 20/6

PITTSBURGH UNIV PA DEPT OF CHEMISTRY

(U) Shift-Variant Multidimensional Systems.

DESCRIPTIVE NOTE: Annual rept. 1 Feb 83-31 Jan 84.

MAR 84 80P

PERSONAL AUTHORS: BOSS, N. K. ;

CONTRACT NO. AFOSR-83-0038

PROJECT NO. 2304

TASK NO. A6

MONITOR: AFOSR
TR-84-0689

UNCLASSIFIED REPORT

ABSTRACT: (U) To a great extent the techniques for analysis and restoration of images has been developed under the assumption that the system is linear shift-invariant (LSI). These techniques are successful in some cases because a system which is diffraction-limited or a system whose object plane undergoes uniform linear motion perpendicular to the system reference axis does indeed satisfy these assumptions. However, LSI systems are singled out for study mainly because of the widespread understanding of the Fourier Transform theory along with well-known fast algorithms for its implementation. In comparison with LSI systems, very little work has been done on linear shift-variant (LSV) systems. Most of the research on two dimensional LSV systems has been done on restoration techniques by means of coordinate transformations. This technique, decomposes the LSV system into a distortion of the input plane followed by a shift-invariant operation and terminated by a distortion of the output plane. The primary objective of this research is to provide not only a mathematical structure for the state-space modeling of discrete LSV systems but to apply this model to the problems of efficient analysis and deconvolution of multidimensional systems.

DESCRIPTORS: (U) *Mathematical models, *Image restoration, Fourier transformation, Theory, Coordinates, Transformations(Mathematics), Two dimensional, Linearity, Degradation, Distortion, Air Force research

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EVI198

IDENTIFIERS: (U) Linear shift variant systems, PE81102F, Multidimensional systems, Image understanding, PE81102F, WUAFOSR2304A6

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A144 754

7/5

COLUMBIA UNIV NEW YORK DEPT OF CHEMISTRY

(U) Organic Photochemical Mechanisms,

84

5P

PERSONAL AUTHORS: Turro, N. J. ;

CONTRACT NO. AFOSR-81-0013

PROJECT NO. 2303

TASK NO. 82

MONITOR: AFOSR
TR-84-0860

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Photochemistry, v25
n89 p69-72 1984.

Reprint: Organic Photochemical Mechanisms.

DESCRIPTORS: (U) *Photochemical reactions, *Organic
compounds, *Reaction kinetics, Instrumentation, Solvents,
Homogeneity, History

IDENTIFIERS: (U) PE81102F, WUAFOSR2303B2

AD-A144 707

7/3

CALIFORNIA UNIV SANTA BARBARA DEPT OF CHEMISTRY

(U) Ligand (Adsorbate) Substitutions at Metal Surfaces:
Aromatic Compounds and Halides at Smooth
Polycrystalline Platinum Electrodes.

DEC 83 6P

PERSONAL AUTHORS: Sorlaga, M. P. ; White, J. H. ; Song, D. ;
Hubbard, A. T. ;

CONTRACT NO. AFOSR-81-0149

PROJECT NO. 2303

TASK NO. A1

MONITOR: AFOSR
TR-84-0884

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Physical Chemistry,
v88 n11 p2284-2287, 27 Dec 83.

Reprint: Ligand (Adsorbate) Substitutions at Metal
Surfaces: Aromatic Compounds and Halides at Smooth
Polycrystalline Platinum Electrodes.

DESCRIPTORS: (U) *Substitution reactions, *Surface
reactions, *Platinum, Adsorption, Ligands, Halides,
Aromatic compounds, Reprints

IDENTIFIERS: (U) PE81102F, WUAFOSR2303A1

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AD-A144 707

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI19B

AD-A144 671 12/1

AD-A144 658 12/1

RUTGERS - THE STATE UNIV NEW BRUNSWICK N J DEPT OF
MATHEMATICS

PITTSBURGH UNIV PA CENTER FOR MULTIVARIATE ANALYSIS

(U) Analysis and Regulation of Nonlinear and Generalized
Linear Systems.

(U) Tests for Sphericity under Correlated Multivariate
Regression Equations Model.

DESCRIPTIVE NOTE: Interim rept. 15 Jun 83-14 Jun 84,

DESCRIPTIVE NOTE: Technical rept.,

JUL 84 10P

JUL 84 33P

PERSONAL AUTHORS: Sontag, E. D. ;

PERSONAL AUTHORS: Sarkar, S. ; Krishnalah, P. R. ;

CONTRACT NO. F49620-79-C-0117, AFOSR-80-0198

REPORT NO. TR-84-37

PROJECT NO. 2304

CONTRACT NO. F49620-82-K-0001

TASK NO. A6

PROJECT NO. 2304

MONITOR: AFOSR
TR-84-0694

MONITOR: AFOSR
TR-84-0688

UNCLASSIFIED REPORT

ABSTRACT: (U) This work emphasizes research on discrete-
time nonlinear system theory as well as algebraic methods
in the analysis of generalized classes of linear systems.
(Author)

DESCRIPTORS: (U) *Nonlinear systems, *Linear systems,
*Nonlinear analysis, Control, Parameters, Dynamics,
Differential equations

IDENTIFIERS: (U) Linear analysis, WUAFOSR2304A6,
PE81102F

UNCLASSIFIED REPORT

ABSTRACT: (U) In this report, the authors considered
some tests for sphericity of the error covariance matrix
under a correlated multivariate regression equations
model. Asymptotic distributions of the test statistics
associated with the above procedures are also derived.
(Author)

DESCRIPTORS: (U) *Mathematical models, Spheres,
Multivariate analysis, Regression analysis

IDENTIFIERS: (U) Sphericity, PE81102F, WUAFOSR2304A5

AD-A144 671

AD-A144 658

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A144 654 20/5 13/8

AD-A144 635 7/5

BATTELLE COLUMBUS LABS OH

VIRGINIA UNIV CHARLOTTESVILLE DEPT OF CHEMISTRY

(U) Three-Dimensional Photochemical Machining with Lasers.

(U) Electron-Transfer Quenching of Ruthenium(II) Photosensitizers by Mercury(II) in Aqueous Nitrate Media.

DESCRIPTIVE NOTE: Semi-Annual technical rept. no. 2, 1
Aug 83-31 Jan 84.

84 7P

MAY 84 22P

PERSONAL AUTHORS: Schwerzel, R. E. ;
Demas, J. N. ; DeGraff, B. A. ;PERSONAL AUTHORS: Hauenstein, B. L. , Jr. ; Dresslick, W. J. ;
Demas, J. N. ; DeGraff, B. A. ;

CONTRACT NO. F49620-82-C-0077, ARPA Order-4522

CONTRACT NO. AFOSR-78-3590, NSF-CHE82-06279

MONITOR: AFOSR
TR-84-0588

PROJECT NO. 2303

TASK NO. 82

MONITOR: AFOSR
TR-84-0683

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also Annual technical rept. no. 1,
AD-A143 928.

UNCLASSIFIED REPORT

ABSTRACT: (U) Research on new photoinitiator systems and improved photopolymers for photochemical machining with lasers has resulted in the successful laboratory demonstration of crossed-beam polymerization, although some single-beam polymerization still occurs under the condition examined to date. Porphyrin sensitizers and acrylate polymers have given the best results so far, especially when the samples are first degassed under vacuum to remove oxygen. A computer-controlled three-axis translation stage has been constructed to move the sample relative to the (fixed) laser beams. Future work will be directed toward continued improvement of the polymer materials. (Author)

DESCRIPTORS: (U) *Photochemical reactions, *Machining, *Lasers, Polyacrylates, Laser beams, Three dimensional, Polymerization, Demonstrations, Cross beam devices, Sensitizing, Porphyrins

IDENTIFIERS: (U) Photoinitiator systems, PE81102F

SUPPLEMENTARY NOTE: Pub. in Jnl. of Physical Chemistry, v88 n11 p2418-2422 1984.

Reprint: Electron-Transfer Quenching of Ruthenium(II) Photosensitizers by Mercury(II) in Aqueous Nitrate Media.

DESCRIPTORS: (U) *Photosensitivity, *Electron transfer, Quenching, Ruthenium, Mercury, Nitrates, Reprints

IDENTIFIERS: (U) PE81102F, WUAFOSR230382

AD-A144 656

AD-A144 635

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A144 817 5/10

AD-A144 817 CONTINUED

GEORGIA INST OF TECH ATLANTA SCHOOL OF PSYCHOLOGY

(U) Estimating the Number and Duration of Cognitive Processes Using the Within-Task Subtractive Method.

IDENTIFIERS: (U) Task analysis, Choice reaction time, Sternberg tasks, Latencies. WUAFOSR2313D9, PE61102F

DESCRIPTIVE NOTE: Final technical rept. 15 Apr 83-14 Apr 84.

JUN 84 63P

PERSONAL AUTHORS: Corso, G. M.; Patterson, M. J. ;

CONTRACT NO. AFOSR-83-0088

PROJECT NO. 2313

TASK NO. D9

MONITOR: AFOSR
TR-84-0898

UNCLASSIFIED REPORT

ABSTRACT: (U) This research was directed towards developing a methodology for partitioning choice-reaction time into component parts, using both the additive-factor and the subtractive method. This methodology involved the use of a modified Sternberg task in which the subjects viewed two horizontally presented letters and were required to classify each of the letters into either the positive or negative set. The classification procedure was performed by depressing two response keys on the same trial. Latency measures were obtained for the elapsed time between stimulus onset and the first response and between the first response and the second response. Input and output times were then derived. In addition, three different types of interruption stimuli (auditory, visual and auditory-visual) were presented at various times prior to and after the onset of the classification stimulus. Input and output latencies were differentially influenced by the different types of interruption stimuli and by the onset time of those interruption stimuli.

DESCRIPTORS: (U) *Interruption, *Test construction(Psychology), *Cognition, *Reaction time, Classification, Stimuli, Time, Parts, Performance(Human), Decision making, Reaction(Psychology), Addition, Factor analysis, Test methods, Classification, Visual signals, Acoustic signals, Delay

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DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. EVI198

AD-A144 615

12/1

AD-A144 610 8/11 8/6

BROWN UNIV PROVIDENCE RI LEFSCHETZ CENTER FOR DYNAMICAL SYSTEMS

WEIDLINGER ASSOCIATES MENLO PARK CA

(U) Approximation of Feedback Controls for Parabolic Systems.

(U) Large-Scale Numerical Analysis of Three-Dimensional Seismic Waves.

DESCRIPTIVE NOTE: Final rept. 1 Oct 82-30 Sep 83.

83

SP

MAY 84 53P

PERSONAL AUTHORS: Barks, H. T. ; Kuntisch, K. ;

PERSONAL AUTHORS: Wojcik, G. L. ; Vaughan, D. K. ;

CONTRACT NO. DAAG29-79-C-0161, AFOSR-81-0198

REPORT NO. R-8403

MONITOR: AFOSR
TR-84-0295

CONTRACT NO. F49620-82-C-0002

UNCLASSIFIED REPORT

Availability: Pub. in IEEE, p247-251 1983 (No copies furnished by DTIC/NTIS).

Reprint: Approximation of Feedback Controls for Parabolic Systems.

DESCRIPTORS: (U) *Riccati equation,

*Operators(Mathematics), Feedback, Control, Computations, Approximation(Mathematics), Hilbert space, Partial differential equations, Reprints

IDENTIFIERS: (U) *Parabolic systems

UNCLASSIFIED REPORT

ABSTRACT: (U) This report concludes our study of large-scale vectorized numerical analysis applied to time domain seismic wave phenomena in filled basins. Applications include calculations of waves from simple surface or buried sources in a variety of idealized 2-D Basin and Range models (36,000 to 120,000 nodes) described in an interim report, and one large 3-D model (400,000 nodes) from Yucca Flat, Nevada Test Site, described here. Analysis is based on an explicit, finite element, elastic wave solver designed for vectorized execution on the CRAY-1. The primary result of the present 3-D study is that, given the database available from investigations in Yucca Flat, Nevada Test Site, the size of feasible 3-D computational models on the CRAY-1S is adequate to simulate elastic wave fields and interpret arrivals for comparison with existing 3-D ground motion data. Synthetic seismograms from a 400,000 element 3-D simulation of the COALORA event at Yucca Flat indicate that a significant source of transverse motion on radial lines through the source is diffraction from a discontinuity in the Rainier Mesa tuff layer across the Yucca fault. Successful time-domain simulations in 3-D are feasible with pipelined supercomputers but optimal processing requires careful tailoring of the algorithm to vectorize inner code loops and eliminate nonessential

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OTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI19B

AD-A144 610 CONTINUED

AD-A144 609 20/8

arithmetic.

ARIZONA UNIV TUCSON ENGINEERING EXPERIMENT STATION

DESCRIPTORS: (U) *Seismic waves, *Basins(Geographic),
Mountains, Three dimensional, Mathematical models, Time
domain, Finite element analysis, Computerized simulation,
Algorithms, Earth crust

(U) Analytic Solution of the Spencer-Lewis Angular-Spatial
Moments Equations.

DESCRIPTIVE NOTE: Final rept. 1 Jun 83-31 May 84.

IDENTIFIERS: (U) Wave fields, CRAY-1 computers,
WUAFOSR2309A1, PE81102F

JUL 84 53P

PERSONAL AUTHORS: Filippone, W. L. ;

CONTRACT NO. AFOSR-83-0174

PROJECT NO. 2301

TASK NO. D8

MONITOR: AFOSR
TR-84-0697

UNCLASSIFIED REPORT

ABSTRACT: (U) An exact solution for the angular-spatial
moments of the Spencer-Lewis equation is given, along
with methods for reconstructing the electron density
function. The new solution techniques is implemented in a
computer code and several sample calculations are carried
out with monoenergetic plane sources of electrons in
infinite media of aluminum and carbon. The sample
calculations produce the electron distribution in space
and path length rather than some integrated quantity such
as the energy deposition profile. Such analytic solutions
are intended to serve as benchmarks for testing numerical
electron transport codes. (Author)

DESCRIPTORS: (U) *Moments, *Electron transport,
Mathematical analysis, Electron density, Normal density
functions, Numerical methods and procedures, Computer
programs, Electrons, Distribution, Aluminum, Media, Paths,
Length

IDENTIFIERS: (U) *Angular spatial moments, *Spencer
Lewis equation, WUAFOSR2301D9, PE81102F

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A144 800 9/2

AD-A144 599 7/4

VIRGINIA UNIV CHARLOTTESVILLE DEPT OF CHEMISTRY

PITTSBURGH UNIV PA DEPT OF CHEMISTRY

(U) An Axes-Drawing Program for the Hewlett Packard Digital Plotters.

(U) Evidence for Chemisorption Site Selection Based on an Electron-Donor Mechanism.

JUL 83 2P

MAY 84 7P

PERSONAL AUTHORS: Pearson, T. D. L.; Demas, J. N.;

PERSONAL AUTHORS: Klauber, C.; Alvey, M. D.; Yates, J. T., Jr.;

CONTRACT NO. AFOSR-78-3590

CONTRACT NO. AFOSR-82-0133

PROJECT NO. 2303

PROJECT NO. 2303

TASK NO. 82

TASK NO. A2

MONITOR: AFOSR

MONITOR: AFOSR
TR-84-0680

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Chemical Education, v60 n7 p568-569 Jul 83.

SUPPLEMENTARY NOTE: Pub. in Chemical Physics Letters, v106 n5 p477-481, 4 May 84.

Reprint: An Axes-Drawing Program for the Hewlett Packard Digital Plotters.

Reprint: Evidence for Chemisorption Site Selection Based on an Electron-Donor Mechanism.

DESCRIPTORS: (U) *Computer programming, *Plotters, *Computers, Symbolic programming, High level languages, Axes, Labels, Reprints

DESCRIPTORS: (U) *Chemisorption, *Site selection, *Electron donors, Nickel, Clustering, Theory, Reprints

IDENTIFIERS: (U) Hewlett Packard Digital Plotter, AXES program, PE61102F, WJAFOSR2303B2

IDENTIFIERS: (U) PE61102F, WJAFOSR2303A2

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A144 593 9/4 17/5 17/8 17/2
HONEYWELL SYSTEMS AND RESEARCH CENTER MINNEAPOLIS MN
(U) Hierarchical Multisensor Image Understanding.
DESCRIPTIVE NOTE: Annual rept. Oct 83-Sep 84, Interim
rept. 1 Jul 83-30 Jun 84,
JUL 84 66P
PERSONAL AUTHORS: Aggarwal, R. K. ;
CONTRACT NO. F49620-83-C-0134
PROJECT NO. 2304
TASK NO. A7
MONITOR: AFOSR
TR-84-0639

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Original contains color plates: All
DTIC and NTIS reproductions will be in black and white.

ABSTRACT: (U) This report describes the research results
on Honeywell's Hierarchical Multisensor Image
Understanding program. Honeywell is developing a unified
framework for the different hierarchical levels of image
processing such as segmentation, detection,
classification, and identification of outdoor scenes and
across different sensor modalities such as millimeter
wave, infrared, and visible. Current activities on the
project are reviewed under the following headings: (1)
artificial-intelligence-based generic image segmentation
and object recognition; (2) evidence-confidence paradigms
for image understanding; (3) hierarchical systems theory
for control structures; and (4) invariant methods in
image understanding. Also discussed are scene analysis
and attributed graphs.

DESCRIPTORS: (U) *Image processing, *Pattern recognition,
*Target recognition, Control, Graphs, Theory, Millimeter
waves, Segmented, Detection, Images, Multisensors,
Identification, Outdoor, Recognition, Hierarchies,
Classification, Artificial intelligence, Infrared spectra,
Visible spectra, Control systems, Confidence level,
Information theory

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DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. EVI198

AD-A144 557 5/10 9/2

AD-A144 535 5/9 5/10 6/2 12/1
9/2

WASHINGTON UNIV ST LOUIS MO BEHAVIOR RESEARCH LAB

PERCEPTRONICS INC WOODLAND HILLS CA

(U) A Psychophysiological Mapping of Cognitive Processes.

(U) Operator Alertness/Workload Assessment Using Stochastic Model-Based Analysis of Myoelectric Signals.

DESCRIPTIVE NOTE: Progress rept., 1 Mar 83-29 Feb 84,

DESCRIPTIVE NOTE: Interim rept. 1 Oct 82-31 Mar 84,

MAY 84 10P

PERSONAL AUTHORS: Stern, J. A.; Goldstein, R. ;

APR 84 97P

REPORT NO. 0059-84-1

PERSONAL AUTHORS: Madni, A. M.; Scopp, R. I.; Chu, Y. Y.; Purcell, D. D. ;

CONTRACT NO. F49820-83-C-0059

REPORT NO. PPR-1128-84-4

PROJECT NO. 2313

CONTRACT NO. F49820-83-C-0001

TASK NO. A4

PROJECT NO. 2313

MONITOR: AFOSR
TR-84-0701

TASK NO. A4

MONITOR: AFOSR
TR-84-0703

UNCLASSIFIED REPORT

ABSTRACT: (U) This technical report consists of a description of the work done in the Washington University Behavior Research Laboratories supported by the AFOSR. The text describes the hardware assembled for the proposed studies and the software which has been developed for stimulus presentation and execution. The study format is described as well as some preliminary results bearing on the issues to be addressed. (Author)

DESCRIPTORS: (U) *Psychophysiology,
*Perception(Psychology), *Computerized simulation,
Computer programming, Data acquisition, Data reduction,
Stimulation(Physiology), Stimuli, Eye movements,
Behavioral Science

IDENTIFIERS: (U) PEB1102F, WUAFOSR2313A4

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UNCLASSIFIED REPORT

ABSTRACT: (U) This interim report documents the work done to this point on Autoregressive Integrated Moving-Average (ARIMA) model-based analysis of myoelectric signals. The ARIMA modelling procedure and the hardware required for collecting myoelectric data are described in detail. Pattern analysis methods for characterizing the myoelectric signals under different levels of alertness/workload are discussed. Additionally, the various tasks in the Experimental Control Package that subjects must perform while being monitored are described. Finally, an analysis of data obtained during experimental sessions is provided giving some indication of discriminability of the ARIMA signatures over different task difficulty levels and subjects. Results of this analysis indicate that the first AR parameter is the most useful feature in differentiating workload/alertness level. Additionally, this feature was shown to be reliable for each underlying level of alertness or load in a given task.

DESCRIPTORS: (U) *Operators(Personnel),
*Performance(Human), *Pilots, *Workload,
*Electromyography, *Monitoring, *Mathematical models,
Muscles, Vigilance, Attention, Stochastic processes,

AD-A144 535

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EV1198

AD-A144 535 CONTINUED

Regression analysis, Signal processing, Pattern recognition, Data processing, Microcomputers, Data acquisition, Muscles, Site selection, Electrodes

IDENTIFIERS: (U) *MES(Myoelectric Signals),
*ARIMA(Autoregressive Integrated Moving Average),
Alertness, WUAFOSR2313A4, PE81102F

AD-A144 533 9/4

CITY COLL NEW YORK DEPT OF ELECTRICAL ENGINEERING

(U) Spread Spectrum, Acquisition and Tracking.

DESCRIPTIVE NOTE: Annual technical rept. 1 Mar 83-29 Feb 84.

FEB 84 58P

PERSONAL AUTHORS: Schilling, D. L. ;

REPORT NO. RF-447105

CONTRACT NO. AFOSR-83-0102

PROJECT NO. 2305

TASK NO. B3

MONITOR: AFOSR
TR-84-0704

UNCLASSIFIED REPORT

ABSTRACT: (U) This report discusses the following subjects: A New Rapid Acquisition Technique for Direct Sequence Spread Spectrum Communications. The rapid acquisition technique described here can be used in direct sequence spread spectrum systems. The technique employs a double threshold which defines when a decision can be made. These thresholds change at each examination instant. Using this technique a significant reduction in the acquisition time of a direct sequence spread spectrum signal is obtained. A New Double Threshold Acquisition Scheme Applied to the Fading Channel in Frequency Hopping Spread Spectrum.

DESCRIPTORS: (U) *Spread spectrum, *Acquisition, *Frequency shift, *Tracking, *Frequency agility, Fading(Electromagnetic waves), Threshold effects, Channels, Time

IDENTIFIERS: (U) WUAFOSR2305B3, PE81102F

IAC NO. GC-840841

IAC DOCUMENT TYPE: GACIAC - MICROFICHE --

IAC SUBJECT TERMS: G--(U)Spread spectrum, Communication,

AD-A144 533

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A144 533 CONTINUED

Acquisition, Tracking(position), Threshold, Decisions,
Frequency hopping, Signal processing, Simulation.;

AD-A144 528 9/5 20/5 13/8

COLUMBIA UNIV NEW YORK DEPT OF ELECTRICAL ENGINEERING

(U) Direct Writing of Microstructures for Microelectronics.

DESCRIPTIVE NOTE: Rept. no. 1 (Final), 1 Jan 81-31 Dec 83,

JUL 84 89P

PERSONAL AUTHORS: Osgood, R. M., Jr;

CONTRACT NO. F49620-82-K-0008, ARPA Order-4487

PROJECT NO. 2301

TASK NO. A1

MONITOR: AFOSR
TR-84-0635

UNCLASSIFIED REPORT

ABSTRACT: (U) A program to investigate direct laser writing for semiconductor processing is described. In this program the following results were obtained: The first reported fabrication of submicrometer diffraction gratings in GaAs; Development of a new technique for writing patterns of the dielectric material, SiO₂; Measurement of the conductivity and properties of metal interconnects; The first demonstration of laser-enhanced plasma etching; and The first observation of deep-UV enhanced liquid etching of GaAs.

DESCRIPTORS: (U) *Writing, *Lasers, *Semiconductors, Microelectronics, Microstructure, Dielectrics, Processing, Fabrication, Etching, Patterns, Gratings(Spectra), Gallium arsenides, Diffraction

IDENTIFIERS: (U) Plasma etching, WUAFOSR2301A1, PE61102F

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A144 527 5/10

AD-A144 525 20/7 20/9

MEDICAL RESEARCH INST OF SAN FRANCISCO CA

MARYLAND UNIV COLLEGE PARK DEPT OF ELECTRICAL
ENGINEERING

(U) The Mechanism of Human Velocity Discrimination.

(U) Investigation of Ion Beam Production and Acceleration
Using Linear Electron Beams and a Pulse Powered Plasma
Focus.

DESCRIPTIVE NOTE: Annual scientific rept. 1 Oct 83-30 Mar
84.

APR 84 11P

DESCRIPTIVE NOTE: Final progress rept. 1 Apr 83-31 Mar 84.

PERSONAL AUTHORS: McKee, S. P. ;

MAR 84 73P

CONTRACT NO. AFOSR-82-0345

CONTRACT NO. AFOSR-83-0145

PROJECT NO. 2313

PROJECT NO. 2301

TASK NO. A5

TASK NO. A7

MONITOR: AFOSR

MONITOR: AFOSR

TR-84-0702

TR-84-0841

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) Human velocity discrimination depends on
the precise detection of minute time variations (under 1
msec). A physiological summation process called
'sequential recruitment' is responsible for this
remarkable temporal sensitivity. Precise velocity
discrimination is possible with very brief target
durations (less than 100 msec). The oculomotor systems
used this sensory signal to initiate smooth pursuit eye
movements.

DESCRIPTORS: (U) *Velocity, *Discrimination, *Visual
perception, Motion, Targets, Moving targets,
Judgement(Psychology), Performance(Human)

IDENTIFIERS: (U) Stereopsis, WJAFOSR2313A5, PE81102F

ABSTRACT: (U) An intense relativistic electron beam
cannot propagate in a metal drift tube when the current
exceeds the space charge limit. Very high charge density
and electric field gradients (100 to 1000 MV/m) develop
at the beam front and the electrons are reflected. When a
neutral gas or a plasma is present, collective
acceleration of positive ions occur, and the resulting
charge neutralization enables the beam to propagate.
Experimental results, theoretical understanding, and
schemes to achieve high ion energies by external control
of the beams front velocity will be reviewed. (Author)

DESCRIPTORS: (U) *Ion beams, *Propagation, *Electron
beams, *Plasma accelerators, Tubes, Magnetic fields,
Experimental data, Theory, Currents, Space charge,
Electric fields, Gradients, Charge density, High density,
Electrodes, Metals, Particle accelerator components,
Cations

IDENTIFIERS: (U) WJAFOSR2301A7, PE81102F

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AD-A144 525

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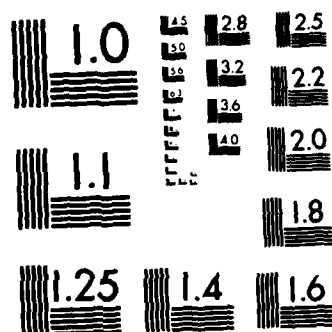
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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A144 506

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AD-A144 505

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COLORADO UNIV AT BOULDER

VIRGINIA UNIV CHARLOTTESVILLE DEPT OF CHEMISTRY

(U) Flowing Afterglow Studies of Ion Reaction Dynamics Using Infrared Chemiluminescence and Laser-Induced Fluorescence.

84 35P

83 8P

PERSONAL AUTHORS: Bierbaum, V. M. ; Ellison, G. B. ; Leone, S. R. ;

PERSONAL AUTHORS: Buell, S. L. ; Demas, J. N. ;

CONTRACT NO. F49620-83-C-0013

CONTRACT NO. AFOSR-78-3590

PROJECT NO. 2303

PROJECT NO. 2303

TASK NO. B1

TASK NO. B2

MONITOR: AFOSR

MONITOR: AFOSR

TR-84-0873

TR-84-0882

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Gas Phase Ion Chemistry. v3 ch17 p1-39 1984.

SUPPLEMENTARY NOTE: Pub. in Jnl. of Physical Chemistry. v87 n23 p4875-4881 1983.

Reprint: Flowing Afterglow Studies of Ion Reaction Dynamics Using Infrared Chemiluminescence and Laser-Induced Fluorescence.

Reprint: Heterogeneous Preparation of Singlet Oxygen Using an Ion-Exchange-Resin-Bound Tris(2,2'-bipyridine)-ruthenium(II) Photosensitizer.

DESCRIPTORS: (U) *Afterglows, *Ions, *Chemical reactions, Chemiluminescence, Laser induced fluorescence, Molecular vibration, Reprints, Infrared radiation

DESCRIPTORS: (U) *Photosensitivity, *Oxygen, *Synthesis(Chemistry), Production, Ion exchange resins, Ruthenium compounds, Reprints, Catalysts

IDENTIFIERS: (U) *Ion molecule reactions, *Flowing afterglows, WUAFOSR2303A1, PE81102F

IDENTIFIERS: (U) Photocatalysts, WUAFOSR2303B2, PE81102F

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DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. EVI198

AD-A144 487 20/10

AD-A144 484 5/10

NEW ORLEANS UNIV LA

CARNEGIE-MELLON UNIV PITTSBURGH PA DEPT OF BIOMEDICAL
ENGINEERING

(U) Zeeman Studies of Shallow Donors and Excitons in
Quantum Wells.

(U) Gaze Control during Horizontal and Vertical Target
Tracking.

DESCRIPTIVE NOTE: Final rept. 1 May 83-29 Feb 84.

DESCRIPTIVE NOTE: Final rept..

MAR 84 25P

MAR 84 23P

PERSONAL AUTHORS: Greene, R. L. ;

PERSONAL AUTHORS: Bahill, A. T. ;

CONTRACT NO. AFOSR-83-0120

CONTRACT NO. AFOSR-83-0137

PROJECT NO. 2308

PROJECT NO. 2313

TASK NO. D9

TASK NO. D9

MONITOR: AFOSR

MONITOR: AFOSR

TR-84-0627

TR-84-0698

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) A theoretical study has been made of the shallow donor and Wannier exciton within a one-dimensional quantum well. The variational method was used with a cylindrical Gaussian basis set. In order to facilitate comparison with future experimental measurements of excited states of these systems, an external magnetic field was assumed perpendicular to the interfaces between the barrier material and the well. Calculations reveal that the choice of matching conditions used at the interfaces has little effect on the binding energies of the ground or first few excited states of the shallow donor, except for well widths considerably smaller than the effective Bohr radius. The results of calculations of the shallow donor ground and first few excited states are presented for a variety of well sizes and magnetic field strengths. Similar results are given for the ground state of the Wannier exciton. (Author)

DESCRIPTORS: (U) *Zeeman effect, *Excitons, *Quantum electronics, Ground state, Shallow depth, Electron donors, Excitation, Barriers, Magnetic fields, One dimensional, Interfaces, Semiconductors, Gallium arsenides, Nuclear binding energy

IDENTIFIERS: (U) Quantum wells, PE81102F, WUAFOSR2308D9

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DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. EVI198

AD-A144 483

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WISCONSIN UNIV-MADISON DEPT OF COMPUTER SCIENCES

(U) Iterative Methods for Elliptic Problems and the Discovery of 'q'.

DESCRIPTIVE NOTE: Technical rept..

JUL 84 48P

PERSONAL AUTHORS: Parter, S. V. ;

REPORT NO. CSTR-548

CONTRACT NO. AFOSR-82-0278

PROJECT NO. 2304

TASK NO. A3

MONITOR: AFOSR
TR-84-0838

UNCLASSIFIED REPORT

ABSTRACT: (U) This document considers a direct iterative method for solving the linear system $AU = Y$ which arises from the discretization of a boundary value problem involving an elliptic partial differential operator L of order $2m$.

DESCRIPTORS: (U) *Iterations, *Ellipses, *Linear systems, *Problem solving, Boundary value problems, Operators(Mathematics), Differential equations, Approximation(Mathematics), Eigenvalues, Matrices(Mathematics), Estimates, Finite element analysis, Finite difference theory

IDENTIFIERS: (U) WUAFOSR2304A3, PE61102F

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AD-A144 482

20/4

CALIFORNIA INST OF TECH PASADENA

(U) Experimental Investigation on the Effects of Chemical Heat Release in the Reacting Turbulent Plane Shear Layer.

DESCRIPTIVE NOTE: Doctoral thesis.

JAN 81 126P

PERSONAL AUTHORS: Wallace, A. K. ;

CONTRACT NO. F49620-79-C-0159

PROJECT NO. 2307

TASK NO. A3

MONITOR: AFOSR
TR-84-0850

UNCLASSIFIED REPORT

ABSTRACT: (U) A chemically reacting shear layer between various gases was investigated in a new type of blow-down wind tunnel. The gas streams were inert (helium, nitrogen or argon), but carried up to 10% concentration of reactants, one being ozone and the other nitric oxide. The resulting reaction, $O_3 + NO$ yields $NO_2 + O_2$, was essentially diffusion limited and spontaneous, enabling the temperature rise to be varied at will from zero up to 200 C mean. Flows of Reynolds number up to 5×10 to the fourth power were investigated.

DESCRIPTORS: (U) *Turbulent boundary layer, *Chemical reactions, *Heat of reaction, Shear properties, Layers, Blowdown, Wind tunnels, Reynolds number, Flow, Helium, Argon, Gases, Ozone, Nitrogen oxides

IDENTIFIERS: (U) WUAFOSR2307A3, PE61102F

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A144 481 20/5

AD-A144 477 7/3 7/2

DARTMOUTH COLL HANOVER N H DEPT OF PHYSICS AND ASTRONOMY

GEORGIA UNIV ATHENS DEPT OF CHEMISTRY

(U) High Power Millimeter Wavelength Coherent Radiation Sources.

(U) Bis(dialkylamino)phosphines.

84

8P

DESCRIPTIVE NOTE: Scientific rept. 1 Feb 83-31 Jan 84.

PERSONAL AUTHORS: King, R. B.; Sundaram, P. M.;

JUN 84 79P

CONTRACT NO. AFOSR-81-0051

PERSONAL AUTHORS: Walsh, J. E.;

PROJECT NO. 2303

CONTRACT NO. AFOSR-82-0168

PROJECT NO. 2301

TASK NO. A8

MONITOR: AFOSR
TR-84-0836MONITOR: AFOSR
TR-84-0675

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Organic Chemistry,
v49 n10 p1784-1789 1984.

UNCLASSIFIED REPORT

Reprint: Bis(dialkylamino)phosphines.

ABSTRACT: (U) During the reporting period, Cerenkov laser resonators with a rectangular configuration were analyzed, constructed and experimentally tested. All of the previous work was based upon cylindrical resonators, a choice which was convenient because of the intrinsic symmetry of the beam transport and focussing. In many potential applications, however, an amplifier would be more useful than an oscillator and a structure which, coupled to a linearly-polarized field would then be far more convenient. It was for this purpose that the rectangular dielectric slab waveguide structures were analyzed and tested.

DESCRIPTORS: (U) *Phosphine, Chemical reactions, Stereochemistry, Reprints

IDENTIFIERS: (U) *Phosphine/Bis(Dialkylamino), Steric hindrance, Lithium aluminum hydride, WJFOSR2303B2, PEG1102F

DESCRIPTORS: (U) *Lasers, *Millimeter waves, Resonators, Coherent electromagnetic radiation, Beams (Electromagnetic), Waveguides, Electron beams, Cerenkov radiation, High power

IDENTIFIERS: (U) WJAFOSR2301A8, PEG1102F

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EV1198

AD-A144 476 7/5

AD-A144 475 7/5

VIRGINIA UNIV CHARLOTTESVILLE DEPT OF CHEMISTRY

COLUMBIA UNIV NEW YORK DEPT OF CHEMISTRY

(U) Interactions of Ruthenium(II) Photosensitizers with Nontoxic Surfactants: The Binding Region and Specific-Anion Effects.

(U) Energetics and Dynamics of Radical Pairs in Micelles. Measurement of the Average Singlet-Triplet Energy Gap by Means of the Magnetic Field Dependence of (13)C CIDNP.

84 8P

84 4P

PERSONAL AUTHORS: Hauenstein, B. L., Jr.; Dressick, W. J.; Gilbert, T. B.; Demas, J. N.; DeGraff, B. A.;

PERSONAL AUTHORS: Zimmt, M. B.; Doubleday, C. Jr.; Turro, N. J.;

CONTRACT NO. AFOSR-78-3590, NSF-CHE82-06279

CONTRACT NO. AFOSR-81-0013

PROJECT NO. 2303

PROJECT NO. 2303

TASK NO. B2

TASK NO. B2

MONITOR: AFOSR TR-84-0678

MONITOR: AFOSR TR-84-0681

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Physical Chemistry, v88 n9 p1902-1905 1984.

SUPPLEMENTARY NOTE: Pub. in Jnl. of the American Chemical Society, v106 n11 p3363-3365 1984.

Reprint: Interactions of Ruthenium(II) Photosensitizers with Nonionic Surfactants: The Binding Region and Specific-Anion Effects.

Reprint: Energetics and Dynamics of Radical Pairs in Micelles. Measurement of the Average Singlet-Triplet Energy Gap by Means of the Magnetic Field Dependence of (13)C CIDNP.

DESCRIPTORS: (U) *Photosensitivity, *Surface active substances, *Ruthenium compounds, Covalent bonds, Anions, Molecule molecule interactions, Reprints

DESCRIPTORS: (U) *Photolysis, Free radicals, Carbon, Radioactive isotopes, Magnetic fields, Energetic properties, Dynamics, Reprints

IDENTIFIERS: (U) Micelles, WUAFOSR2303B2, PE81102F

IDENTIFIERS: (U) Micelles, WUAFOSR2303B2, PE81102F

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OTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A144 474 3/2

LOUISIANA STATE UNIV BATON ROUGE DEPT OF PHYSICS AND ASTRONOMY

(U) Two New Extremely Hot Pulsating White Dwarfs.

APR 84 SP

PERSONAL AUTHORS: Bond, H. E. ; Grauer, A. D. ; Green, R. F. ; Liebert, J. W. ;

CONTRACT NO. AFOSR-82-0192

PROJECT NO. 2301

TASK NO. A2

MONITOR: AFOSR TR-84-0652

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Astrophysical Jnl., v279 n2 p781-787, 15 Apr 84.

Reprint: Two New Extremely Hot Pulsating White Dwarfs.

DESCRIPTORS: (U) *Dwarf stars, Photometry, Ultraviolet spectra, Reprints

IDENTIFIERS: (U) White dwarf stars, WUAFOSR2301A2, PEG1102F

AD-A144 471 18/3 8/11

CALIFORNIA INST OF TECH PASADENA SEISMOLOGICAL LAB

(U) Source Models and Yield-Scaling Relations for Underground Nuclear Explosions at Amchitka Island.

JUN 84 22P

PERSONAL AUTHORS: Lay, T. ; Helmberger, D. V. ; Harkrider, D. G. ;

CONTRACT NO. F49620-83-C-0025

PROJECT NO. 4397

TASK NO. A3

MONITOR: AFOSR TR-84-0845

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Bulletin of the Seismological Society of America, v74 n3 p843-862 Jun 84.

Reprint: Source Models and Yield-Scaling Relations for Underground Nuclear Explosions at Amchitka Island.

DESCRIPTORS: (U) *Nuclear explosion testing, *Seismic data, Broadband, Aleutian Islands, Sources, Depth, Underground explosions, Yield(Nuclear explosions), Scaling factors, Mathematical models, Reprints

IDENTIFIERS: (U) Amchitka Island, WUAFOSR4397A3, PEG1102F

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DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. EVI198

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AD-A144 465 12/1

ILLINOIS UNIV AT URBANA DEPT OF MECHANICAL AND INDUSTRIAL
ENGINEERING

WISCONSIN UNIV-MADISON DEPT OF COMPUTER SCIENCES

(U) Deflagration to Shock to Detonation Transition of
Energetic Propellants.

(U) A Study of Some Multi-Grid Ideas.

DESCRIPTIVE NOTE: Technical rept.,

DESCRIPTIVE NOTE: Annual technical rept., 1 Jun 83-30 May
84.

JUN 84 48P

JUL 84 44P

PERSONAL AUTHORS: Krieger, H.; Butler, P. B.; Cudak, C.;

PERSONAL AUTHORS: Kamowitz, D.; Parter, S. V.;

REPORT NO. UTLU-ENG-84-4006

REPORT NO. CSTR-545

CONTRACT NO. AFOSR-81-0145

CONTRACT NO. AFOSR-82-0275

PROJECT NO. 2308

PROJECT NO. 2304

TASK NO. A1

TASK NO. A3

MONITOR: AFOSR
TR-84-0634MONITOR: AFOSR
TR-84-0637

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

Availability: Document partially illegible.

ABSTRACT: (U) It is well known that explosive-based propellants are susceptible to detonation from the controlled deflagration mode of combustion. In some instances a confined zone of granulated propellant adjacent to a zone of cast propellant can provide a rapid enough pressure-rise rate to shock initiate the cast material. If the cast propellant has voids, the detonation will initiate at some location ahead of the granulated bed/cast material interface. This report is a summary of the research activities that focus on the analysis and modeling of the physics of such highly transient flows.

DESCRIPTORS: (U) *Deflagration, *Solid rocket propellants, *Detonations, Castings, Transitions, Models, Physics, Flow, Transients, Shock(Mechanics), Explosives, Voids

IDENTIFIERS: (U) PE81102F, WJAFOSR2308A1

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ABSTRACT: (U) In an effort to understand certain ideas and concepts associated with multi-grid iterations the authors give an in-depth study of a particular simple problem. They consider a standard finite-difference system associated with a two-point boundary value problem. $-(pu' + bu' + qu = 0, u(0) = u(1) = 0$. The operators $Ih2h$, $Ih2h$ are 'operator' based interpolation and projection operators while the smoothers are the damped Jacobi iterations with parameter $\alpha > 0$. This document determines the exact rates of convergence for the two-grid scheme and upper bounds for the multi-grid schemes. Experimental results are discussed. (Author)

DESCRIPTORS: (U) *Grids, *Iterations, *Finite difference theory, Operators(Mathematics), Boundary value problems, Partial differential equations, Interpolation, Convergence, Eigenvectors, Experimental data, Estimates

IDENTIFIERS: (U) PE81102F, WJAFOSR2304A3

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A144 458 7/5 7/4

AD-A144 457 12/1

VIRGINIA UNIV CHARLOTTESVILLE DEPT OF CHEMISTRY

WASHINGTON UNIV SEATTLE DEPT OF MATHEMATICS

(U) Properties of Osmium(II) Photosensitizers in Aqueous and Sodium Lauryl Sulfate Micellar Media.

(U) Deterministic and Stochastic Optimization Problems of Bolza Type in Discrete Time.

84 8P

83 20P

PERSONAL AUTHORS: Dressick, W. J. ; Raney, K. W. ; Demas, J. N. ; DeGraff, B. A. ;

PERSONAL AUTHORS: Rockafellar, R. T. ; Wets, R. J. B. ;

CONTRACT NO. AFOSR-78-3590, NSF-CHE82-06249

CONTRACT NO. F49620-82-K-0012

PROJECT NO. 2303

PROJECT NO. 2304

TASK NO. B2

TASK NO. A8

MONITOR: AFOSR TR-84-0878

MONITOR: AFOSR TR-84-0804

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Inorganic Chemistry, v23 n7 p875-880 1984.

SUPPLEMENTARY NOTE: Pub. in Stochastics, v10 p273-312 1983.

Reprint: Properties of Osmium(II) Photosensitizers in Aqueous and Sodium Lauryl Sulfate Micellar Media.

Reprint: Deterministic and Stochastic Optimization Problems of Bolza Type in Discrete Time.

DESCRIPTORS: (U) *Photosensitivity, *Electrochemistry, *Photochemical reactions, *Spectroscopy, *Osmium compounds, Complex compounds, Solar energy, Reprints

DESCRIPTORS: (U) *Calculus of variations, *Determinants(Mathematics), *Stochastic processes, Optimization, Dynamic programming, Lagrangian functions, Multiplication, Reprints

IDENTIFIERS: (U) Micelles, PE81102F, WUAFOSR230382

IDENTIFIERS: (U) Bolza type, PE81102F, WUAFOSR2304A8

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A144 456 11/3 20/2

AD-A144 455 12/1

OKLAHOMA STATE UNIV STILLWATER DEPT OF CHEMISTRY

FLORIDA STATE UNIV TALLAHASSEE DEPT OF STATISTICS

(U) Theoretical Investigations of Elementary Processes in the Chemical Vapor Deposition of Silicon from Silane. Unimolecular Decomposition of SiH4.

(U) Negative Association of Random Variables. with Applications.

MAY 84 13P

83 12P

PERSONAL AUTHORS: Viswanathan,R. ;Thompson,D. L. ;Raff,L. M. ;

PERSONAL AUTHORS: Joag-Dev,K. ;Proschan,F. ;

CONTRACT NO. AFOSR-82-0311

CONTRACT NO. F49620-82-K-0007

PROJECT NO. 2303

PROJECT NO. 2304

TASK NO. A2

TASK NO. A5

MONITOR: AFOSR
TR-84-0686

MONITOR: AFOSR
TR-84-0685

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Chemical Physics, v80 n8 p4230-4240, 1 May 84.

SUPPLEMENTARY NOTE: Pub. in the Annals of Statistics, v11 n1 p286-295 1983.

Reprint: Theoretical Investigations of Elementary Processes in the Chemical Vapor Deposition of Silicon from Silane. Unimolecular Decomposition of SiH4.

Reprint: Negative Association of Random Variables. with Applications.

DESCRIPTORS: (U) *Silicon, *Vapor deposition, Silanes. Decomposition, Dynamics, Theory, Reprints

DESCRIPTORS: (U) *Random variables, Multivariate analysis, Inequalities, Statistical distributions, Reprints

IDENTIFIERS: (U) ACVD(Chemical Vapor Deposition), PE61102F, WUAFOSR2303A2

IDENTIFIERS: (U) Negative association, PE61102F, WUAFOSR2304A5

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DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. EVI198

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AD-A144 438 21/2 20/4 21/8.2 12/1

WASHINGTON UNIV SEATTLE DEPT OF PSYCHOLOGY

PRINCETON COMBUSTION RESEARCH LABS INC NJ

(U) Mathematical Models of the Event Related Potential.

(U) Analysis of Combustion Oscillations in Heterogeneous Systems.

DESCRIPTIVE NOTE: Interim rept. 30 Sep 83-1 Apr 84.

DESCRIPTIVE NOTE: Final rept. 15 Mar 82-14 Mar 83.

APR 84 34P

NOV 83 61P

PERSONAL AUTHORS: Hunt, E. B. ;

PERSONAL AUTHORS: Ben-Reuven, M. ; Summerfield, M. ;

CONTRACT NO. AFOSR-83-0289

REPORT NO. PCRL-FR-83-005

PROJECT NO. 2313

CONTRACT NO. F49620-82-C-0062

TASK NO. A4

PROJECT NO. 2308

MONITOR: AFOSR

TASK NO. A1

TR-84-0699

MONITOR: AFOSR

TR-84-0700

UNCLASSIFIED REPORT

ABSTRACT: (U) In electrophysiology, the Event Related Potential is assumed to be composed of several underlying component wave forms. Principal Component Analysis is a statistical technique that has been used to uncover the components by analysis of the observed wave form. The mathematical assumptions behind Principal Component Analysis are examined, and their plausibility is questioned. It is pointed out that under certain conditions the component forms may not accurately be recovered by Principal Component Analysis. Under other circumstances violations of some of the mathematical assumptions does not appear to affect the accuracy of recovery of component waveforms. The points made are illustrated by an analysis of simulated wave forms constructed from known components.

DESCRIPTORS: (U) *Electroencephalography, *Statistical analysis, Accuracy, Waveforms, Electrophysiology, Simulation, Mathematical models

IDENTIFIERS: (U) Event related potential, Principal component analysis, PEG1102F, WUAFOSR2313A4

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UNCLASSIFIED REPORT

ABSTRACT: (U) This analysis is aimed at the near-wall processes in an injected, axisymmetric, viscous flow. It is a part of an overall study of solid propellant rocket instability, in which cold flow simulation is evaluated as a tool to elucidate possible instability-driving mechanisms. One such prominent mechanism seems to be visco-acoustic coupling, as indicated by earlier detailed order of magnitude analysis. The major component of the overall study involves numerical simulation of the full set of coreflow equations of motion (nonsteady, axisymmetric) by a modified McCormack integration technique. To clarify some of the physical interactions inherent in the various regimes of the flowfield, two (separate) singular perturbation analyses have been carried out. The head-end boundary regime, and the injected sidewall layer, both involve appreciable viscous dissipation, and hence are characterized by predominantly parabolic differential systems. The inverse square root of the injection Reynolds number serves as a small-perturbation quantity.

DESCRIPTORS: (U) *Axially symmetric flow, *Viscous flow, *Mathematical models, *Combustion stability, *Boundary layer flow, Combustion, Oscillation, Heterogeneity, Integration, Numerical analysis, Solid propellant rocket

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

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engines, Cold flow, Simulation, Equations of motion, Injection, Reynolds number, Parabolas, Flow fields, Dissipation, Viscosity, Coupling(Interaction), Acoustic waves, Walls, Cores, Unsteady flow, Perturbations

STANFORD UNIV CA DEPT OF COMPUTER SCIENCE
(U) Implementation of Logical Query Languages for Databases.

IDENTIFIERS: (U) McCormack integration technique, Instability, Viscoacoustic coupling, Core flow, Near wall combustion, PE61102F, WJAFOSR2308A1

DESCRIPTIVE NOTE: Technical rept..

MAY 84 43P

PERSONAL AUTHORS: Ullman, J. D. ;

REPORT NO. STAN-CS-84-1000

CONTRACT NO. AFOSR-80-0212

PROJECT NO. 2304

TASK NO. A7

MONITOR: AFOSR
TR-84-0840

UNCLASSIFIED REPORT

ABSTRACT: (U) We examine methods of implementing queries about relational databases in the case that these queries are expressed in first-order logic as a collection of Horn clauses. Because queries may be defined recursively, straightforward methods of query evaluation do not always work, and a variety of strategies have been proposed to handle subsets of recursive queries. We shall express such query evaluation techniques as 'capture rules' on a graph representing clauses and predicates. The essential property of capture rules is that they can be applied independently, thus providing a clean interface for query evaluation systems that use several different strategies in different situations. We show how rules suggested previously can be fit into this framework, and we propose some new capture rules and generalizations of old ones.
(Author)

DESCRIPTORS: (U) *Data bases, *Interrogation, *Data management, *Information processing, Graphs, Logic, Recursive functions, Man computer interface, Programming languages, Strategy, Language

IDENTIFIERS: (U) Horn clauses, *Query languages, Relational data bases, Recursive queries, Capture rules, PE61102F, WJAFOSR2304A7

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DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. EVI198

AD-A144 414

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SRI INTERNATIONAL MENLO PARK CA

(U) Research on Parallelism in Problem-Solving Systems.

DESCRIPTIVE NOTE: Annual rept., 1 Sep 82-31 Aug 83.

JUL 84

9P

PERSONAL AUTHORS: Wilkins, D. E. ;

CONTRACT NO. F49620-79-C-0188

PROJECT NO. 2304

TASK NO. A7

MONITOR: AFOSR
TR-84-0595

UNCLASSIFIED REPORT

ABSTRACT: (U) This report describes the progress to date on work to date under the contract. Research on planning and problem-solving systems was begun at SRI International in September 1979. Progress has been described in detail in three annual reports (1980, 1981, and 1982). The main task of this research program is to develop powerful methods of representing, generating and executing hierarchical plans that contain parallel actions. Execution involves monitoring the state of the world and possibly replanning if things do not proceed as expected. Two different approaches to these problems are being pursued under this contract. The first is heuristic; it involves building an actual computer program that provides a representation from which it then generates plans. This approach comprises the majority of the effort on this project. The second approach is to investigate the theoretical foundations of planning. This will not, in all likelihood, result in a program, but it will formalize the planning problem and one solution to it. (Author)

DESCRIPTORS: (U) *Problem solving, *Hierarchies, *Planning, Heuristic methods, Research management, Robotics, Artificial intelligence, Computer programs, Cognition

IDENTIFIERS: (U) SIPE(System For Interactive Planning and Execution Monitoring), PE61102F, WUAFOSR2304A7

AD-A144 414

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AD-A144 405

20/6

7/5

VIRGINIA UNIV CHARLOTTESVILLE DEPT OF CHEMISTRY

(U) Phase Plane Method for Deconvolution of Luminescence Decay Data with a Scattered-Light Component.

JUL 83

5P

PERSONAL AUTHORS: Love, J. C. ; Demas, J. N. ;

CONTRACT NO. AFOSR-78-3590, NSF-CHE82-06279

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR
TR-84-0677

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Analytical Chemistry, v58 n1 p82-85 1984.

*Reprint: Phase Plane Method for Deconvolution of Luminescence Decay Data with a Scattered-Light Component.
DESCRIPTORS: (U) *Fluorescence, *Luminescence, Convolution, Decay, Light scattering, Computerized simulation, Reprints

IDENTIFIERS: (U) *Deconvolution, Phase plane method, PE61102F, WUAFOSR230382

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DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. EVI198

AD-A144 404

7/4

OKLAHOMA STATE UNIV STILLWATER DEPT OF CHEMISTRY

(U) Unimolecular Dissociation of Methane: A Trajectory Study Using Metropolis Sampling.

JUN 84

12P

PERSONAL AUTHORS: Raff, L. M.; Viswanathan, R.; Thompson, D. L.;

CONTRACT NO. AFOSR-82-0311

PROJECT NO. 2303

TASK NO. A2

MONITOR: AFOSR
TR-84-0671

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Chemical Physics, v80 n12 p8141-8149, 15 Jun 84.

Reprint: Unimolecular Dissociation of Methane: A Trajectory Study Using Metropolis Sampling.

DESCRIPTORS: (U) *Chemical dissociation, *Methane, Rates, Chemical reactions, Trajectories, Monte Carlo method, Reprints

IDENTIFIERS: (U) *Unimolecular reactions, PE81102F, WJAFOSR2303A2

AD-A144 402

7/5

20/5

CORNELL UNIV ITHACA NY DEPT OF CHEMISTRY

(U) Deactivation of I(52P1/2) by CF3I, ClI3I, C2H5I, and CH4.

84

10P

PERSONAL AUTHORS: Gu, Z. N.; Young, A. T.; Houston, P. L.;

CONTRACT NO. F49620-83-K-0012

PROJECT NO. 2303

TASK NO. B1

MONITOR: AFOSR
TR-84-0672

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in International Jnl. of Chemical Kinetics, v18 p669-677 1984.

Reprint: Deactivation of I(52P1/2) by CF3I, CH3I, C2H5I, and CH4.

DESCRIPTORS: (U) *Photolysis, *Deactivation, *Lasers, Iodine, Iodides, Alkyl radicals, Relaxation, Reprints

IDENTIFIERS: (U) PE81102F, WJAFOSR2303B1

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DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. EVI198

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AD-A144 400 8/7 18/3 8/11

CHICAGO UNIV IL JAMES FRANCK INST

CALIFORNIA INST OF TECH PASADENA SEISMOLOGICAL LAB

(U) Shot-Noise-Limited Detection Scheme for Two-Beam Laser Spectroscopies.

(U) The Effects of Tectonic Release on Short-Period P Waves from NTS Explosions.

JAN 84 5P

JUN 84 28P

PERSONAL AUTHORS: Andor, L. ; Lorincz, A. ; Stiemion, J. ; Smith, D. D. ; Rice, S. A. ;

PERSONAL AUTHORS: Lay, T. ; Wallace, T. C. ; Helmberger, D. V.

CONTRACT NO. F49620-83-C-0002

CONTRACT NO. F49620-83-C-0025

PROJECT NO. 2303

PROJECT NO. 4397

TASK NO. B1

TASK NO. A3

MONITOR: AFOSR
TR-84-0687

MONITOR: AFOSR
TR-84-0656

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Rev. Sci. Instrum., v55 n1 p64-67 Jan 84.

SUPPLEMENTARY NOTE: Pub. in Bulletin of the Seismological Society of America, v74 n3 p819-842 Jun 84.

Reprint: Shot-Noise-Limited Detection Scheme for Two-Beam Laser Spectroscopies.

Reprint: The Effects of Tectonic Release on Short-Period P Waves from NTS Explosions.

DESCRIPTORS: (U) *Shot noise, *Detection, Demodulation, Linearity, Response, Reprints

DESCRIPTORS: (U) *Primary waves (Seismic waves), *Faults (Geology), Tectonics, Release, Joints, Nuclear explosion testing, Seismic data, Azimuth, Amplitude, Earth models, Underground explosions, Nevada, Reprints

IDENTIFIERS: (U) *Laser spectroscopy, *Two beam laser spectroscopy, PE81102F, WUAFOSR2303B1

IDENTIFIERS: (U) Pahute Mesa, Tectonic release, PE81102F, WUAFOSR4397A3

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AD-A144 400

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A144 392 7/4

AD-A144 391 9/1

UNITED TECHNOLOGIES RESEARCH CENTER EAST HARTFORD CT

TEXAS TECH UNIV LUBBOCK

(U) Electronic Structure of the Helium Molecular Anion He2.

(U) Electrode Erosion Phenomena in a High-Energy Pulsed Discharge.

DESCRIPTIVE NOTE: Scientific journal article.

MAR 84 12P

APR 84 5P

PERSONAL AUTHORS: Michels, H. H. ;

PERSONAL AUTHORS: Donaldson, A. L. ; Hagler, M. O. ;
Kristiansen, M. ; Jackson, G. ; Hatfield, L. ;

REPORT NO. UTRC-926533-2

CONTRACT NO. AFOSR-84-0015

CONTRACT NO. F49620-83-C-0094

PROJECT NO. 2301

PROJECT NO. 2301

TASK NO. A7

TASK NO. A7

MONITOR: AFOSR

TR-84-0843

MONITOR: AFOSR

TR-84-0858

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Physical Review Letters, v52
n16 p1413-1416, 16 Apr 84.

SUPPLEMENTARY NOTE: Pub. in IEEE Transactions on Plasma
Science, vps-12 n1 p28-38 Mar 84.

Reprint: Electronic Structure of the Helium Molecular
Anion He2.

Reprint: Electrode Erosion Phenomena in a High-Energy
Pulsed Discharge.

DESCRIPTORS: (U) *Helium, *Anions, *Molecular structure,
Potential energy, Wave functions, Reprints

DESCRIPTORS: (U) *Electrodes, *Electric discharges,
Erosion, Pulses, Spark gaps, High energy, Reprints

IDENTIFIERS: (U) *Electronic structure, PE61102F,
WUAFOSR2301A7

IDENTIFIERS: (U) PE61102F, WUAFOSR2301A7

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A144 388 20/8

OREGON UNIV EUGENE

(U) Atomic Inner-Shell Transitions,

APR 84 9P

PERSONAL AUTHORS: Crasemann, B.; Chen, M. H.; Mark, H.;

CONTRACT NO. F49620-84-C-0038, ARPA Order-4087

PROJECT NO. 2301

TASK NO. A4

MONITOR: AFOSR
TR-84-0857

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of the Optical Society
of America B, v1 n2 p224-231 Apr 84.

Reprint: Atomic Inner-Shell Transitions.

DESCRIPTORS: (U) *Nuclear shell models, *Transitions,
Nuclear binding energy, Ions, Relativity theory

IDENTIFIERS: (U) *Atomic inner shells, WJAFOSR2301A4,
PE81102F

AD-A144 380

12/1

FLORIDA STATE UNIV TALLAHASSEE DEPT OF STATISTICS

(U) Random Averaging of Vector Elements.

JUN 84 5P

PERSONAL AUTHORS: Proschan, F.; Shaked, M.;

CONTRACT NO. F49620-82-K-0007, NSF-MCS82-00098

PROJECT NO. 2304

TASK NO. A5

MONITOR: AFOSR
TR-84-0859

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in SIAM Jnl. of Applied
Mathematics, v44 n3 p587-590 Jun 84.

Reprint: Random Averaging of Vector Elements.

DESCRIPTORS: (U) *Vector analysis, Real numbers,
Iterations, Reprints

IDENTIFIERS: (U) *Random averaging, PE81102F,
WJAFOSR2304A5

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DTIC REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. EVI198

AD-A144 375 20/8

OREGON UNIV EUGENE DEPT OF PHYSICS

(U) N X-Ray Emission Rates in Dirac-Fock Approximation,

JUL 84 8P

PERSONAL AUTHORS: Chen, M. H. ; Crasemann, B. ;

CONTRACT NO. F49620-84-C-0039, ARPA Order-4087

PROJECT NO. 2301

TASK NO. A4

MONITOR: AFOSR
TR-84-0895

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Physical Review A, v30 n1
p170-178 Jul 84.

Reprint: N X-Ray Emission Rates in Dirac-Fock
Approximation.

DESCRIPTORS: (U) *X rays, *Emission, Rates, Transitions,
Relativity theory, Reprints

IDENTIFIERS: (U) *Atomic inner shells, Dirac Fock
approximation, WUAFOSR2301A4, PEG1102F

AD-A144 368 12/1 20/1

DELAWARE UNIV NEWARK APPLIED MATHEMATICS INST

(U) The Inverse Scattering Problem for Time-Harmonic
Acoustic Waves,

JUL 84 30P

PERSONAL AUTHORS: Colton, D. ;

CONTRACT NO. AFOSR-81-0103

PROJECT NO. 2304

TASK NO. A4

MONITOR: AFOSR
TR-84-0853

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in SIAM Review, v26 n3 p323-350
Jul 84.

Reprint: The Inverse Scattering Problem for Time-Harmonic
Acoustic Waves.

DESCRIPTORS: (U) *Inverse scattering, *Mathematical
models, *Acoustic waves, Operators(Mathematics), Far
field, Optimization, Reprints

IDENTIFIERS: (U) PEG1102F, WUAFOSR2304A4

AD-A144 375

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

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AD-A144 357 20/8 12/1

STANFORD UNIV CA INFORMATION SYSTEMS LAB

CARNEGIE-MELLON UNIV PITTSBURGH PA DEPT OF ELECTRICAL
ENGINEERING

(U) Spatio-Temporal Spectral Analysis by Eigenstructure
Methods.

(U) Multi-Disciplinary Techniques for Understanding Time-
Varying Space-Based Imagery.

DESCRIPTIVE NOTE: Technical rept..

DESCRIPTIVE NOTE: Annual rept. 1 May 83-30 May 84.

84 43P

JUN 84 160P

PERSONAL AUTHORS: Wax, M. ; Shan, T. J. ; Kallath, T. ;

PERSONAL AUTHORS: Casasent, D. ; Sanderson, A. ; Kanade, T. ;

CONTRACT NO. AFOSR-83-0228

CONTRACT NO. F49620-83-C-0100

PROJECT NO. 2304

PROJECT NO. 2304

TASK NO. A6

TASK NO. A7

MONITOR: AFOSR

TR-84-0487

MONITOR: AFOSR

TR-84-0597

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) This paper presents new algorithms for
estimating the spatio-temporal spectrum of the signals
received by a passive array. The algorithms are based on
the eigenstructure of the covariance and spectral-density
matrices of the received signals. These allow partial
correlation between the sources and thus are applicable
to certain kinds of multipath problems. Simulation
results that illustrate the performance of the new
algorithms are presented. (Author)

ABSTRACT: (U) A multi-disciplinary program for space-
based image processing is reported. This project combines
optical and digital processing techniques and pattern
recognition, image understanding and artificial
intelligence methodologies. Time-change image processing
was recognized as the key issue to be addressed. Three
time-change scenarios were defined based on the frame
rate of the data change. This report details the recent
research on: various statistical and deterministic image
features, recognition of sub-pixel targets in time-
varying imagery, and 3-D object modeling and recognition.
(Author)

DESCRIPTORS: (U) *Algorithms, *Spectrum analysis, Time
domain, Computerized simulation, Estimates, Eigenvectors,
Multipath transmission, Covariance, Signals, Impingement,
Two dimensional, Matrices(Mathematics), Narrowband,
Broadband

DESCRIPTORS: (U) *Image processing, *Space based,
*Mathematical models, Image registration, Optical
processing, Digital systems, Pattern recognition,
Artificial intelligence, Scenarios, Targets, Three
dimensional, Graphs, Algorithms, Models, Air Force
research

IDENTIFIERS: (U) Passive arrays, Frequency domain

IDENTIFIERS: (U) Image understanding, Scene analysis,
PE81102F, WUAFOSR2304A7

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A144 385 9/S

STANFORD UNIV CA INFORMATION SYSTEMS LAB

(U) A New Adaptive Antenna System for Coherent Signals and Interference.

DESCRIPTIVE NOTE: Technical rept.,

OCT 83 8P

PERSONAL AUTHORS: Shan, T. J.; Kailath, T. ;

CONTRACT NO. F49620-79-C-0088, AFOSR-83-0228

PROJECT NO. 2304

TASK NO. A6

MONITOR: AFOSR
TR-84-0488

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Presented at the Asilomar Conference (17th), Oct 83. Sponsored in part by Contracts DAAG28-79-C-0218 and DAAG28-81-K-0057.

ABSTRACT: (U) In this paper the authors introduce a new adaptive antenna system able to work well even when the desired signal and the interference are coherent. The present adaptive beamformers fail to operate in these cases. The results of simulations appear to confirm the theoretical predictions. (Author)

DESCRIPTORS: (U) *Processing equipment, *Adaptive systems, *Antenna arrays, *Beam forming, Computerized simulation, Coherence, Signals, Antennas, Theory, Signals, Predictions, Coherence

IDENTIFIERS: (U) Coherent processors, Weight vectors, Coherent interference, PE61102F, WJAFOSR230488

AD-A144 385

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AD-A144 348

7/4

MASSACHUSETTS INST OF TECH CAMBRIDGE DEPT OF CHEMISTRY

(U) Stimulated Emission Spectroscopy: A Complete Set of Vibrational Constants for X 1A1 Formaldehyde.

JUN 84 13P

PERSONAL AUTHORS: Reisner, D. E. ; Field, R. W. ; Kinsey, J. L. ; Dai, H. L. ;

CONTRACT NO. F49620-83-C-0010

PROJECT NO. 2303

TASK NO. B1

MONITOR: AFOSR
TR-84-0870

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Chemical Physics. v80 n12 p5968-5978, 15 Jun 84.

Reprint: Stimulated Emission Spectroscopy: A Complete Set of Vibrational Constants for X 1A1 Formaldehyde.

DESCRIPTORS: (U) *Formaldehyde, *Emission spectroscopy, Pumping, Vibrational spectra, Diatomic molecules, Polyatomic molecules, Reprints

IDENTIFIERS: (U) Stimulated emission pumping, PE61102F, WJAFOSR230381

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SEARCH CONTROL NO. EVI198

AD-A144 347 20/8 20/10

CHICAGO UNIV IL JAMES FRANCK INST

(U) Very Low Energy Collision Induced Vibrational Relaxation: An Overview,

83 31P

PERSONAL AUTHORS: Rice, S. A.; Carjan, C. ;

CONTRACT NO. F49620-83-C-0002

PROJECT NO. 2303

TASK NO. B1

MONITOR: AFOSR
TR-84-0888

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Laser Chemistry, v2 p137-166
1983.

Reprint: Very Low Energy Collision Induced Vibrational Relaxation: An Overview.

DESCRIPTORS: (U) *Particle collisions, *Quantum theory, Molecular vibration, Low energy, Relaxation, Literature surveys, Reprints

IDENTIFIERS: (U) Overviews, PEG1102F, WUAFOSR230381

AD-A144 346 7/4

VIRGINIA UNIV CHARLOTTESVILLE DEPT OF CHEMISTRY

(U) Excited-State Lifetime Measurements: Linearization of the Forster Equation by the Phase-Plane Method.

DEC 83 4P

PERSONAL AUTHORS: Love, J. C.; Demas, J. N. ;

CONTRACT NO. AFOSR-78-3590

PROJECT NO. 2303

TASK NO. B2

MONITOR: AFOSR
TR-84-0881

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Review of Scientific Instruments, v54 n12 p1787-1789 Dec 83.

Reprint: Excited-State Lifetime Measurements: Linearization of the Forster Equation by the Phase-Plane Method.

DESCRIPTORS: (U) *Molecules, *Excitation, *Fluorescence, *Molecular states, Life span(Biology), Resonance, Luminescence, Reprints, Energy transfer, Reprints

IDENTIFIERS: (U) *Forster equation, PEG1102F, WUAFOSR230382

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A144 345 3/2

AD-A144 328 20/7

ENVIRONMENTAL RESEARCH INST OF MICHIGAN ANN ARBOR

OKLAHOMA STATE UNIV STILLWATER DEPT OF CHEMISTRY

(U) Experimental Evidence of the Uniqueness of Phase Retrieval from Intensity Data.

(U) Theoretical Studies of Tunneling Processes in Three-Body Exchange Reactions of van der Waals Rare Gas Dimers.

84 13P

APR 84 10P

PERSONAL AUTHORS: Fienup, J. R. ;

PERSONAL AUTHORS: Turner, R. A. ; Raff, L. M. ; Thompson, D. L.

REPORT NO. ERIM-181900-8-J

CONTRACT NO. F49620-82-K-0018

CONTRACT NO. AFOSR-82-0311

PROJECT NO. 2311

PROJECT NO. 2303

TASK NO. A1

TASK NO. A2

MONITOR: AFOSR
TR-84-0647

MONITOR: AFOSR
TR-84-0682

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Indirect Imaging, p89-109 1984.

SUPPLEMENTARY NOTE: Pub. in Jnl. of Chemical Physics, v80 n7 p3189-3196 Apr 84.

Reprint: Experimental Evidence of the Uniqueness of Phase Retrieval from Intensity Data.

Reprint: Theoretical Studies of Tunneling Processes in Three-Body Exchange Reactions of van der Waals Rare Gas Dimers.

DESCRIPTORS: (U) *Radio astronomy, Phase control, Two dimensional, Intensity, Reprints

DESCRIPTORS: (U) *Tunneling, *Dimers, *Collisions, Rare gases, Theory, Exchange reactions, Reprints

IDENTIFIERS: (U) Phase retrieval, PE81102F, WJAFOSR2311A1

IDENTIFIERS: (U) Van Der Waals complexes, WJAFOSR2303A2, PE81102F

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A144 319 9/2

STANFORD UNIV CA DEPT OF COMPUTER SCIENCE

(U) Approaches for Updating Databases with Incompleted Information and Nulls.

APR 84 10P

PERSONAL AUTHORS: Keller, A.; Wilkins, M. W.;

CONTRACT NO. N00038-82-G-0250, AFOSR-80-0212

PROJECT NO. 2304

TASK NO. A2

MONITOR: AFOSR
TR-84-0382

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Presented at the IEEE Computer Data Engineering Conference Proceedings, Los Angeles, CA, Apr 84.

ABSTRACT: (U) In this paper we consider approaches to updating databases containing null values and incomplete information. Our approach distinguishes between modeling incompletely known worlds and modeling changes in these worlds. As an alternative to the open and closed world assumptions, we propose the modified closed world assumption. Along with the discussion of updating, we address some issues of refining incompletely specified information. (Author)

DESCRIPTORS: (U) *Data bases, *Global, *Models, Change detection, Deficiencies, Accuracy, Data processing

IDENTIFIERS: (U) WUAFOSR2304A2, PE81102F

AD-A144 319

AD-A144 318 12/1 20/8

ROCHESTER UNIV NY DEPT OF PHYSICS AND ASTRONOMY

(U) Detection of Gratings Hidden by Diffusers Using Intensity Interferometry.

APR 80 11P

PERSONAL AUTHORS: Newman, D.; Dainty, J. C.;

CONTRACT NO. AFOSR-81-0003

PROJECT NO. 2311

TASK NO. A1

MONITOR: AFOSR
TR-84-0849

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of the Optical Society of America A, v1 n4 p403-411 Apr 84.

Reprint: Detection of Gratings Hidden by Diffusers Using Intensity Interferometry.

DESCRIPTORS: (U) *Correlation techniques, *Gratings(Spectra), *Detection, Coherence, Information processing, Photons, Diffusion, Interferometry, Reprints

IDENTIFIERS: (U) WUAFOSR2311A1, PE81102F

IAC NO. GC-840822

IAC DOCUMENT TYPE: GACIAC - MICROFICHE --

IAC SUBJECT TERMS: G--(U)Gratings(spectra), Detection, Coherence, Correlation techniques, Correlation, Photons, Diffusers, Interferometry, Diffusion, Scattering, Far field, Measurement.;

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI 198

AD-A144 312

3/2

LOUISIANA STATE UNIV BATON ROUGE DEPT OF PHYSICS AND ASTRONOMY

(U) The Elusive Variability of BD +10 deg 2179.

84

4P

PERSONAL AUTHORS: Grauer, A. D.; Drilling, J. S.; Schorbarner, D.;

CONTRACT NO. AFOSR-82-0192, AFOSR-77-3218

PROJECT NO. 2301

TASK NO. A2

MONITOR: AFOSR
TR-84-0651

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Astronomy and Astrophysics, v133 p285-287 1984.

Reprint: The Elusive Variability of BD 10 deg 2179.

DESCRIPTORS: (U) *Stars, Photometry, Stability, Reprints

IDENTIFIERS: (U) Hydrogen-deficient stars, High speed photometry, PE81102F, WJAFOSR2301A2

AD-A144 312

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AD-A144 304

20/8

FLORIDA UNIV GAINESVILLE QUANTUM THEORY PROJECT

(U) A Study of Be2 with Many-Body Perturbation Theory and a Coupled-Cluster Method Including Triple Excitations.

MAY 84 8P

PERSONAL AUTHORS: Lee, Y. S.; Bartlett, R. J.;

CONTRACT NO. AFOSR-82-0028

PROJECT NO. 2301

TASK NO. A4

MONITOR: AFOSR
TR-84-0844

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Chemical Physics, v80 n9 p4371-4377, 1 May 84

Reprint: A Study of Be2 with Many-Body Perturbation Theory and a Coupled-Cluster Method Including Triple Excitations.

DESCRIPTORS: (U) *Excitation, *Dimers, *Perturbation theory, Beryllium, Clustering, Potential energy, Reprints

IDENTIFIERS: (U) PE81102F, WJAFOSR2301A4

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DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A144 302 CONTINUED

ROCKWELL INTERNATIONAL THOUSAND OAKS CA SCIENCE CENTER

(U) Strengthening and Strength Uniformity of Structural Ceramics.

DESCRIPTIVE NOTE: Annual rept. 1 Feb 83-31 Jan 84.

APR 84 78P

PERSONAL AUTHORS: Lange, F. F. ;

REPORT NO. SCS295.3AR

CONTRACT NO. F49620-81-C-0038

PROJECT NO. 2308

TASK NO. A2

MONITOR: AFOSR
TR-84-0808

UNCLASSIFIED REPORT

ABSTRACT: (U) The goal of this work is to identify the processing flaws that limit the strength of sintered ceramics, and to engineer uniform microstructures which either eliminate or minimize the size of these processing flaws. During the first year, a major advance was made by uncovering the fact that agglomerates in powders produce crack-like voids that severely limit the strength of sintered ceramics. Crack-like voids produced by the differential sintering of agglomerates relative to their surrounding powder matrix can be the most detrimental strength degrading flaw in sintered ceramics. As detailed and summarized in the review prepared for a 1984 ASM Conference on Materials for Future Energy Systems, colloidal approaches to powder processing and consolidation can minimize the size of soft agglomerates (those that can be broken apart with surfactants) and hard agglomerates (eliminated by sedimentation of colloidal suspensions). Work has shown that the elimination of the large, soft agglomerates with surfactants increases the average strength of a transformation toughened Al2O3/30 v/o ZrO2 (2.5 v/o Y2O3) composite from 550 MPa (80,000 psi) to 930 MPa (135,000 psi).

DESCRIPTORS: (U) *Ceramic materials, *Sintering.

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*Strength(Mechanics), Fractography, Fracture(Mechanics), Reaction kinetics, Isostatic pressing, Cracks, Voids, Density, Stress strain relations, Agglomerates, Mathematical models, Equations, Structural analysis, Aluminum, Oxygen, Zirconium, Microstructure, Defects(Materials), Surface active substances, Powder metallurgy

IDENTIFIERS: (U) PES1102F, WJAFOSR2308A2

UNCLASSIFIED

DTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

AD-A144 279 11/8 20/11

AD-A144 279 CONTINUED

CARNEGIE MELLON UNIV PITTSBURGH PA DEPT OF METALLURGICAL
ENGINEERING AND MATERIALS SCIENCE

IDENTIFIERS: (U) Aluminum alloy 7090, MUAFOSR2308A1,
PE81102F

(U) Stress Corrosion Cracking of Wrought and P/M High
Strength Aluminum Alloys.

DESCRIPTIVE NOTE: Annual technical rept. 1 Jan-31 Dec 83.

MAR 84 12P

PERSONAL AUTHORS: Thompson, A. W.; Bernstein, I. M.;

REPORT NO. CMU-AFOSR-AL-7

CONTRACT NO. AFOSR-81-0041

PROJECT NO. 2308

TASK NO. A1

MONITOR: AFOSR
TR-84-0813

UNCLASSIFIED REPORT

ABSTRACT: (U) The combined results of the first three years of the program are presented, with emphasis on the stress corrosion cracking and hydrogen embrittlement of the PM 7090 Al alloy. Additional results on 7075 are also given. In particular, the role of temper and loading mode in susceptibility were examined for three test methods---time to failure of notched round bar specimens in a brine solution; straining electrode tests on notched round specimens under cathodic charging; and tensile tests on hydrogen pre-charged notched round specimens. These tests form the basis for an extensive, completed Ph.D. thesis which is summarized here. Stress corrosion testing has also been conducted on 7075 in aluminum chloride solutions and on HP 7075. We remain confident that we have established the basis and a good portion of the results necessary to understand, predict and model the role of hydrogen in stress corrosion cracking of high-strength aluminum alloys.

DESCRIPTORS: (U) *Aluminum alloys, *Stress corrosion, *Cracks, High strength alloys, Powder metallurgy, Hydrogen embrittlement, Loads (Forces), Cracking (Fracturing), Strain (Mechanics), Aging (Materials), Tensile strength, Electrodes, Tensile testers

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STANFORD UNIV CA EDWARD L GINZTON LAB OF PHYSICS

NEW MEXICO UNIV ALBUQUERQUE DEPT OF MATHEMATICS AND STATISTICS

(U) A 15 Nb-Sn Tunnel Junction Fabrication and Properties.

(U) Minigrant Program. A Differential Geometric Approach to Electromagnetic Lens Design.

MAY 84 12P

PERSONAL AUTHORS: Ruckman, D. A. ; Hellman, F. ; Hammond, R. H. ; Beasley, M. R. ;

DESCRIPTIVE NOTE: Final rept. 16 May 83-15 May 84.

REPORT NO. GL-3670

JUN 84 5P

PERSONAL AUTHORS: Stone, A. P. ;

CONTRACT NO. F49620-82-C-0014

REPORT NO. NOTE-282

PROJECT NO. 2301

CONTRACT NO. AFOSR-83-0040

TASK NO. A8

PROJECT NO. 2304

MONITOR: AFOSR TR-84-0629

TASK NO. D9

MONITOR: AFOSR

TR-84-0596

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Applied Physics, v55 n10 p3544-3553, 15 May 84.

Reprint: A 15 Nb-Sn Tunnel Junction Fabrication and Properties.

DESCRIPTORS: (U) *Tunneling(Electronics), *Superconductors, *Junctions, *Niobium alloys, *Tin alloys, Electron beams, Deposition, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2301A8

ABSTRACT: (U) The problems investigated under this minigrant arose in the author's research on electromagnetic (EM) lens design. This research was concerned with an EM lens design technique developed by C. E. Baum for transitioning TEM waves between cylindrical and conical transmission lines.

DESCRIPTORS: (U) *Experimental design, *Lenses, *Electromagnetism, *Geometry, Approach, Maxwells equations, Shape, Parameters, Transmission lines

IDENTIFIERS: (U) *Electromagnetic lens, PE61102F, WUAFOSR2304D9

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STANFORD UNIV CA EDWARD L GINZTON LAB OF PHYSICS

NORTHWESTERN UNIV EVANSTON IL

(U) NbZr Multilayers. I. Structure and Superconductivity,

(U) Markov Processes Applied to Control, Replacement, and Signal Analysis.

MAY 84 10P

DESCRIPTIVE NOTE: Interim rept. 1 Jun-31 Dec 83,

PERSONAL AUTHORS: Lowe, W. P.; Geballe, T. H.;

MAY 84 8P

REPORT NO. GL-3687

PERSONAL AUTHORS: Cinlar, E.;

CONTRACT NO. F49620-82-C-0014

CONTRACT NO. AFOSR-82-0189

PROJECT NO. 2301

PROJECT NO. 2304

TASK NO. A8

TASK NO. A5

MONITOR: AFOSR

MONITOR: AFOSR

TR-84-0628

TR-84-0591

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Physical Review B, v29 no p4961-4968, 1 May 84.

ABSTRACT: (U) Research was performed during this period in four separate areas: Deformation of Solids and Stochastic Flows; Self-Exciting Point Processes; Stability of Dependent Random Variables; and Brownian Motion on Manifolds. This report summarizes progress in these areas. (Author)

Reprint: NbZr Multilayers. I. Structure and Superconductivity.

DESCRIPTORS: (U) *Superconductors, *Sputtering, Crystal structure, Niobium alloys, Zirconium alloys, Layers, Reprints

DESCRIPTORS: (U) *Markov processes, *Microcracking, *Mathematical models, Research management, Continuum mechanics, Deformation, Solids, Flow, Excitation, Points (Mathematics), Random variables, Brownian motion, Nucleation, Control, Replacement, Signals

IDENTIFIERS: (U) PE81102F, WJAFOSR2301A8

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CALIFORNIA UNIV LOS ANGELES DEPT OF MATHEMATICS

Algorithms, Interpolation, Optimization, Value, Vector analysis, Problem solving, Nonlinear systems, Polynomials, Reaction kinetics, Biology

(U) Spline and Weighted Random Directions Method for Nonlinear Optimization.

DESCRIPTIVE NOTE: Technical rept.,

IDENTIFIERS: (U) PE81102F, WJAFOSR2304A3

84 15P

PERSONAL AUTHORS: Milstein, J. ;

CONTRACT NO. AFOSR-80-0243

PROJECT NO. 2304

TASK NO. A3

MONITOR: AFOSR
TR-84-0592

UNCLASSIFIED REPORT

ABSTRACT: (U) This article considers the problem of determining the optimal value and corresponding optimal point of a real function F in M variables. Only function values are given and the computation of derivatives is either not practical or are not available. Bremermann introduced an ingenious and useful optimization algorithm that is guaranteed to converge for polynomials in several variables up to fourth degree. The heart of this method is the use of random directions of search together with a Lagrangian interpolation scheme. This author, having had extensive experience with this algorithm, found that the method has fast convergence at the early stages and tends to stagnate in the neighborhood of the optimal point. Motivated by the usefulness of random directions it is the purpose of this article to present an algorithm based on the proper use of interpolation schemes; (a) Lagrangian interpolations (such as those in Bremermann's methods); (b) spline approximations with variable nodes; (c) pseudo Newton steps using the spline derivatives (not the function); together with a search procedure along weighted random directions. The directions are chosen to be orthogonal using the Gram Schmidt orthogonalization procedure. This algorithm was extensively used for problem solving in mathematical biology, chemical kinetics, and general dynamical systems.

DESCRIPTORS: (U) *Lagrangian functions, *Variables,

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AD-A144 205 20/1 20/11

KENTUCKY UNIV RESEARCH FOUNDATION LEXINGTON

STANFORD UNIV CA EDWARD L GINZTON LAB OF PHYSICS

(U) Harmonic Control to Reduce Torque Pulsations in Brushless DC Motor Drives.

(U) A Unified Theory for Elastic Wave Propagation in Polycrystalline Materials.

DESCRIPTIVE NOTE: Final rept. May 83-Jan 84.

DESCRIPTIVE NOTE: Interim rept. Jul 82-Jul 83.

MAR 84 145P

MAR 84 19P

PERSONAL AUTHORS: Cathey, J. J. ;

PERSONAL AUTHORS: Starke, F. E. ; Kino, G. S. ;

CONTRACT NO. AFOSR-83-0189

REPORT NO. GL-3595

PROJECT NO. 2305

CONTRACT NO. F49620-79-C-0217

TASK NO. D9

PROJECT NO. 2308

MONITOR: AFOSR

TASK NO. A2

TR-84-0807

MONITOR: AFOSR
TR-84-0831

UNCLASSIFIED REPORT

ABSTRACT: (U) The brushless direct current (DC) machine theoretically offers wide speed range torque characteristics like unto the commutator DC machine. However, in brushless DC motor drive systems there exists a performance deficiency in that at near zero speeds driven mechanical loads can respond to the pulsating component of developed torque when simple rotor position-activated switching is utilized. This report analytically develops a pulse width modulation control philosophy that reduces torque pulsations to an acceptable level. (Author)

DESCRIPTORS: (U) *Brushless electric equipment, *Torque, *Control systems, *Pulse position modulation, *Computer programs, Direct current, Motors, Reduction, Deficiencies, Phase modulation, Air Force research

IDENTIFIERS: (U) *Torque pulsations, Cycloconverter drives, Harmonic control, PE61102F, WUAFOSR2305D9

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SUPPLEMENTARY NOTE: Pub. in Jnl. of Acoustical Society of America, v75 n3 p665-681 Mar 84.

Reprint: A Unified Theory for Elastic Wave Propagation in Polycrystalline Materials.

DESCRIPTORS: (U) *Elastic waves, *Acoustic waves, *Wave propagation, Theory, Polycrystalline, Attenuation, Acoustic attenuation, Reprints

IDENTIFIERS: (U) PE61102F, WUAFOSR2306A2

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SOLAR TURBINES INC SAN DIEGO CA

AD-A144 192 20/8
LA JOLLA INST CA

(U) Erosion Mechanisms of Metals.

(U) Low-Energy Collisions Excited Atoms.

DESCRIPTIVE NOTE: Final rept. Jul 78-Aug 83,

DESCRIPTIVE NOTE: Final rept. 1 May 82-30 Apr 84,

MAR 84 108P

JUN 84 11P

PERSONAL AUTHORS: Gulden, M. E. ; Kubarych, K. G. ;

PERSONAL AUTHORS: Neynaber, R. H. ; Tang, S. Y. ;

REPORT NO. SR84-R-4528-03

CONTRACT NO. F49620-82-K-0023

CONTRACT NO. F49620-78-C-0104

PROJECT NO. 2301

TASK NO. 2308

TASK NO. A4

TASK NO. A2

MONITOR: AFOSR
TR-84-0620

MONITOR: AFOSR
TR-84-0633

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

ABSTRACT: (U) This final report summarizes the experimental approach was to initially study a single alloy which exhibits a transition from brittle to ductile type erosion response at room temperature. At a later stage, the dynamic hardness of several substrate materials, both pure metals and alloys, was measured in order to provide a material property obtained under dynamic conditions similar to those during an actual erosion event. The results can be conveniently separated into two phases as follows: Erosion Material Removal Mechanisms, and Correlation Between Dynamic Hardness and Erosion.

ABSTRACT: (U) The report describes molecular-beam studies of ion-pair production, charge transfer, and measurements of the fraction of excited Na atoms in a composite beam of ground-state and excited Na atoms. Some of the experiments involved laser excited Na as a reactant. Included are investigations of the Na-Br, doubly charged Ar-Ar, Ne ion-metastable He, excited Na-Na, and Li-Na systems.

DESCRIPTORS: (U) *Metals, *Carbon steels, *Erosion, Fracture(Mechanics), *Brittleness, Microstructure, Strain rate, Stress strain relations, Plastic deformation, Hardness, Ductility, Melting point, Mechanical properties, Heat treatment, Substrates, Aluminum alloys, Copper, Gold, Molybdenum alloys, Particle size

DESCRIPTORS: (U) *Collisions, *Excitation, *Atoms, *Low energy, Lasers, Charge transfer, Molecular beams, Pair production, Ions, Sodium, Argon, Lithium, Neon, Bromine

IDENTIFIERS: (U) Aluminum 2024, Steel 1095,
WUAFOSR2206A2, PE61102P

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UNIVERSITY OF SOUTHERN CALIFORNIA LOS ANGELES DEPT OF MATHEMATICS

CALIFORNIA UNIV LOS ANGELES DEPT OF SYSTEM SCIENCE

(U) Mathematical Biology, Models and Algorithms.

(U) Sequential Decision Models in Reliability.

DESCRIPTIVE NOTE: Interim rept. 1 Oct 82-30 Sep 83.

83 9P

JUN 84 5P

PERSONAL AUTHORS: Milstein, J. ;

PERSONAL AUTHORS: Miller, B. L. ;

CONTRACT NO. AFOSR-80-0243

CONTRACT NO. AFOSR-82-0305

PROJECT NO. 2304

PROJECT NO. 2304

TASK NO. A3

TASK NO. A6

MONITOR: AFOSR TR-84-0594

MONITOR: AFOSR

TR-84-0590

UNCLASSIFIED REPORT

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Modelling and Data Analysis in Biotechnology and Medical Engineering, p73-78 1983.

ABSTRACT: (U) Investigators studied the problem of the order in which to inspect a system to determine its state and the cause of its possible failure. Results to date are for a series system, and k types of inspections, k 1. This generalizes the direct search results of Matula and Stone where k is fixed at 1. The model also allows multiple inspections in the same period. (Author)

Reprint: Mathematical Biology, Models and Algorithms.

DESCRIPTORS: (U) *Mathematical models, *Mathematical analysis, *Algorithms, Biology, Kinetics, Vector analysis, Parameters, Predictions, Standardization, Reprints

IDENTIFIERS: (U) *Mathematical biology, WJAFOSR2304A3, PE61102F

DESCRIPTORS: (U) *Mathematical models, *Systems analysis, *Reliability, Searching, Decision making, Failure, Sequences, Bayes theorem

IDENTIFIERS: (U) WJAFOSR2304A6, PE61102F

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CALIFORNIA UNIV SANTA BARBARA DEPT OF CHEMISTRY

(U) Electrode Reactions of Oriented Chemisorbed Molecules.
The Effect of Temperature on Reversible Redox,
Irreversible Oxidation, and Reductive Desulfurization,

83

17P

PERSONAL AUTHORS: Sorlag, M. P.; Hubbard, A. T.;

CONTRACT NO. AFOSR-81-0149

PROJECT NO. 2303

TASK NO. A1

MONITOR: AFOSR
TR-84-0319

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: Pub. in Jnl. of Electroanal Chemistry,
v159 p101-116 1983.

Reprint: Electrode Reactions of Oriented Chemisorbed
Molecules. The Effect of Temperature on Reversible Redox,
Irreversible Oxidation, and Reductive Desulfurization.

DESCRIPTORS: (U) *Electrochemistry, Chemical reactions,
Electrodes, Chemisorption, Orientation(Direction),
Temperature, Aromatic compounds, Reprints

IDENTIFIERS: (U) PES1102F, WJAFOSR2303A1

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SOUTHEASTERN CENTER FOR ELECTRICAL ENGINEERING EDUCATION
INC ST CLOUD FL

(U) United States Air Force Geophysics Scholar Program,
1982-1983.

DESCRIPTIVE NOTE: Management and technical rept.,

MAR 84 252P

PERSONAL AUTHORS: Peele, W. D.; Steele, E. L.; Stair, A. T.;

CONTRACT NO. F48620-82-C-0035

PROJECT NO. 2301

TASK NO. D5

MONITOR: AFOSR
TR-84-0622

UNCLASSIFIED REPORT

ABSTRACT: (U) The Geophysics Scholar Program was initiated as a pilot program to provide new Research Scholars with one year appointments to the Air Force Geophysics Laboratory. Extensive mailings were made to technical departments at universities around the United States where programs of prime interest to the Geophysics Laboratory were established. These included Atmospheric Studies, Geophysics, Meteorology and related applied sciences. Ten Scholars were appointed beginning in September 1982 and extending through December 1982, for 12 months duration. Six of these were subsequently continued in the Geophysics Scholar Program under another contract for a second year. Five technical papers were presented by the Scholars during the year. The final technical reports on the Scholar's work are included in this report. This pilot program was judged to a success by both the Scholars and their Laboratory Associates. Their comments were solicited by questionnaire and are included. The Scholars were judged to be beneficial to the Laboratory. The opportunity of having new Research people on a short term basis was felt to be very stimulating and worth while. Their interaction with the Laboratory was very positive. At the initiation of this program, travel funds were provided only for travel to the Laboratory site at the state of the appointment and return funds at the end. Some difficulties were

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subsequently encountered in transferring funds and authorizing travel to technical meetings. This caused some distress among the Scholars. However, overall, the Scholars felt their experience at the Laboratory were constructive steps in their professional development. (Author)

MICHIGAN UNIV ANN ARBOR DEPT OF ELECTRICAL AND COMPUTER ENGINEERING

(U) White Light Optical Information Processing.

DESCRIPTIVE NOTE: Annual rept. no. 6, 15 Aug 82-30 Sep 83.

DESCRIPTORS: (U) *Research management, *Geophysics, *Laboratories, *Education, Students, Universities, Pilot studies

FEB 84 41P

PERSONAL AUTHORS: Leith, E. N. ;

IDENTIFIERS: (U) PEG1102F, WJAFOSR2301DS

CONTRACT NO. AFOSR-81-0243

PROJECT NO. 2305

TASK NO. B1

MONITOR: AFOSR
TR-84-0808

UNCLASSIFIED REPORT

ABSTRACT: (U) Methods for optical processing and holography with light of reduced coherence are described. Specifically described are: (a) a method for making holographic optical elements in light of reduced spatial coherence; (b) a method for doing real time phase conjugation in light of reduced spatial coherence; and (c) a method for doing off-axis Fourier transform holography in spatially incoherent light. (Author)

DESCRIPTORS: (U) *Optical processing, *Information processing, *White light, Fourier transformation, Holography, Signal to noise ratio, Coherence, Incoherence, Interferometry, Air Force research

IDENTIFIERS: (U) PEG1102F, WJAFOSR230581

IAC NO. NT-028798

IAC DOCUMENT TYPE: NTIAC - MICROFICHE --

IAC SUBJECT TERMS: N--(U)HOLOGRAPHY, OPTICAL PROCESSING, INCOHERENT, LIGHT, ROBOTICS, VISION, IMAGE PROCESSING, OPTICAL ELEMENTS, REAL TIME, PHASE, COHERENCE, CONSTRUCTION, GRATINGS, INTERFEROMETRY, COMPARISON, IMAGING TECHNIQUES, RESOLUTION;

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OTIC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. EVI198

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NEW MEXICO UNIV ALBUQUERQUE DEPT OF MATHEMATICS AND STATISTICS

(U) An Anisotropic Lens for Launching TEM Waves on a Conducting Circular Conical System.

JUN 84 84P

PERSONAL AUTHORS: Stone, A. P.; Baum, C. E. ;

REPORT NO. NOTE-285

CONTRACT NO. AFDSR-83-0040

PROJECT NO. 2304

TASK NO. D9

MONITOR: AFOSR
TR-84-0800

UNCLASSIFIED REPORT

ABSTRACT: (U) A differential impedance and transit-time matching approach is used in the design of an anisotropic lens for launching TEM waves from a small source, through the lens, and onto a conducting circular conical system. This approach leads to a system of ordinary differential equations which may be solved exactly to obtain the lens parameters. An approximate solution, which would be applicable to a design procedure, is also given. (Author)

DESCRIPTORS: (U) *Numerical methods and procedures. *Lenses. *Anisotropy. Circular. Conical bodies. Equations. Impedance matching. Launching. Geometry. Parameters. Solutions(General). Graphs. Tables(data)

IDENTIFIERS: (U) *TEM waves. *Electromagnetic lenses. PEB1102F. WUAFORSE230409

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MASSACHUSETTS INST OF TECH CAMBRIDGE FRANCIS BITTER NATIONAL MAGNET LAB

(U) Synthesis and Characterization of Superconducting Electronic Materials.

DESCRIPTIVE NOTE: Semiannual technical rept. 1 Jul-31 Dec 83.

FEB 84 9P

PERSONAL AUTHORS: Meservey, R. H.; Tedrow, P. M.; Orlando, T. P. ;

CONTRACT NO. F49620-82-K-0028

PROJECT NO. 2308

TASK NO. C1

MONITOR: AFOSR
TR-84-0830

UNCLASSIFIED REPORT

ABSTRACT: (U) Films of VN as thin as 5 nm have been made by nitriding V films at high temperature. Tunnel junctions have been successfully made using both oxidized and nitrided amorphous Si barriers. Spin-polarized tunneling results show VN to have a small spin-orbit interaction, but larger than Al. Tunnel junctions have been successfully made on V3Ga and spin-polarized tunneling shows spin splitting up to 20 Teslas. Structure and compositional analysis of the V3Ga films has been carried out. We have successfully made high transition temperature Nb films as thin as 5 nm.

DESCRIPTORS: (U) *Superconductors. *Nitrides. *Vanadium compounds. Synthesis(Chemistry). Thin films. High temperature. Tunneling(Electronics). Junctions. Silicon. Molecular orbitals. Spinning(Motion). Orbits

IDENTIFIERS: (U) PEB1102F. WUAFORSE2306C1

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BATTELLE COLUMBUS LABS OH

(U) Hot Isostatic Pressing of Ceramic Powder Compacts.

DESCRIPTIVE NOTE: Rept. no. 2, Jun 83-Jun 84.

JUN 84 71P

PERSONAL AUTHORS: McCoy, J. K.; Willis, R. R. ;

CONTRACT NO. AFOSR-82-0238

PROJECT NO. 2308

TASK NO. 82

MONITOR: AFOSR
TR-84-0817

models, Theory, Test methods, Computer programs.
Variables, Interfaces, Graphs

IDENTIFIERS: (U) PEB1102F. WUAFOSR2308B2

UNCLASSIFIED REPORT

ABSTRACT: (U) The effect of temperature, pressure and time on the rate of densification of submicron alumina powder during hot isostatic pressing has been determined using a dilatometer to continuously monitor volumetric changes. A Fortran computer program is used to make corrections for thermal expansion of the alumina and the stainless steel can, to determine the relative density of the alumina compact at any point, and to produce report ready graphs depicting the relationship between any two prescribed variables. Analysis of other errors associated with the use of the dilatometer shows that these are negligible compared with thermal expansion effects. The rate of densification is controlled by an interface reaction mechanism never previously observed in the densification of alumina. Mass transport is limited by the movement of grain boundary dislocations which act as sites for atoms to detach from grains. The actual rate limiting process is the diffusion of solute in the lattice since the motion of solute atoms can result in a large number of atoms being freed from a grain boundary dislocation. Once separated from the dislocation the atoms quickly diffuse away.

DESCRIPTORS: (U) *Ceramic materials, *Isostatic pressing, *Packing density, Powders, Aluminum oxides, Stainless steel, Hot pressing, Diffusion coefficient, Porosity, Grain size, Dislocations, Physical properties, Mechanical properties, Thermal expansion, Algorithms, Mathematical

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CLARKSON COLL OF TECHNOLOGY POTSDAM N Y DEPT OF PHYSICS

LA JOLLA INST CA CENTER FOR THE STUDY OF NONLINEAR DYNAMICS

(U) Advanced Studies of Integrable Systems.

(U) The Analytic Structure of Ordinary and Partial Differential Equation.

DESCRIPTIVE NOTE: Interim rept., 6 Jan 83-31 May 84.

JUN 84 25P

DESCRIPTIVE NOTE: Final rept. 1 Mar 83-28 Feb 84.

PERSONAL AUTHORS: Kaup, D. J. ;

MAY 84 12P

CONTRACT NO. AFOSR-82-0184

PERSONAL AUTHORS: Weiss, J. ;

PROJECT NO. 2304

REPORT NO. LJI-R-84-281

TASK NO. A4

CONTRACT NO. AFOSR-83-0095

MONITOR: AFOSR

PROJECT NO. 2304

TR-84-0593

TASK NO. A4

UNCLASSIFIED REPORT

ABSTRACT: (U) A scientific report is presented covering publications resulting from a one year study of advanced topics in integrable systems. These publications cover studies on: Soliton Dynamics in the Pressure of External Forces; Nonlinear Scattering of Whistlers by Electrostatic Fluctuations; The Force Toda Lattice: An example of an almost integrable system; The Soliton Birth Rate in the Forced Toda Lattice; and Whistler Scattering From Density Fluctuations in Magnetized Plasmas. (Author)

DESCRIPTORS: (U) *Integrated systems, *Physics, Whistlers, Scattering, Nonlinear systems, Electrostatics, Magnetization, Plasmas(Physics), Density, Variations

IDENTIFIERS: (U) Solitons, PB81102F, WJAFOSR2304A4

MONITOR: AFOSR
TR-84-0599

UNCLASSIFIED REPORT

ABSTRACT: (U) Contents: The Sine-Gordon Equations; On Classes of Integrable Systems and the Painleve Property; The Painleve Property and Backlund Transformations for the Sequence of Bousinesq Equations; and Backlund Transformation and Linearizations of the Henon-Helles System.

DESCRIPTORS: (U) *Partial differential equations, Numerical methods and procedures, Solutions(General), Transformations(Mathematics), Linearity, Air Force research

IDENTIFIERS: (U) Sine Gordon equations, Painleve property, Bousinesq equations, Backlund transformations, PB81102F, WJAFOSR2304A4

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